Chapter 3: Affected Environment and Environmental Consequences

This section describes the environmental context and consequences of the No-Build and Build Alternatives, as well as measures considered to avoid, minimize, and mitigate impacts associated with the Build Alternative. This section discusses the direct, indirect, and temporary impacts due to construction under each resource section. Cumulative impacts are discussed separately in Section 3.18 at the end of this chapter.

The Build Alternative is comprised of several small discontinuous spot improvements as opposed to continuous improvements and impacts throughout the entire corridor. Figure 3.1 shows the boundaries of the impact area for the proposed improvements.

3.1 LAND USE

Regulatory Setting

Land uses in the project area are generally governed by the ownership of the land. Most of the land in the study area falls within the Grand Staircase-Escalante National Monument, which is managed by the Bureau of Land Management (BLM). The BLM manages the land for the purpose of protecting the land's valuable resources. Land uses in the study area include farming, residential, and commercial. Land ownership and land uses are described in this section.

National Monuments

Land that is granted national monument status under the Antiquities Act of 1906 must receive proper care and management to protect the significant historical, cultural, and scenic values that are the basis for its designation. To provide this care and management, BLM developed the *Grand Staircase-Escalante National Monument Management Plan*.

Wilderness Study Areas

On BLM lands, a wilderness study area (WSA) is a roadless area that has been inventoried and found to have wilderness characteristics, as described in Section 603 of the Federal Land Policy and Management Act of 1976 and Section 2(c) of the Wilderness Act of 1964. Land within WSAs is "protected and managed to preserve [its] natural conditions" (BLM 1993). Neither motorized nor mechanized vehicles are permitted in WSAs. Only zero-impact recreation activities (e.g., hiking and limited camping) and grazing activity associated with grazing allotments that predate the establishment of the WSAs are allowed. BLM gives specific information on existing and new rights-of-way in WSAs in their 1995 document, *Interim Management Policy for Lands Under Wilderness Review* (IMP).

Prime or Unique Farmlands

Farmland identified as "prime," "unique," or of state or local significance is protected by federal and state legislation. The Federal Farmland Protection Policy Act was enacted to minimize the impact that federal programs—including state highway construction projects that involve FHWA—have on the unnecessary and irreversible conversion of farmland to nonagricultural uses. Projects that have the potential to impact these farmlands must be evaluated to establish a farmland conversion impact rating score and must consider alternatives if the adverse impacts exceed the recommended allowable level.

Affected Environment

Land management and use along the corridor is generally governed by the ownership of the land. As shown in Figure 3.2, land is owned by the BLM, U.S. Forest Service (USFS), the State of Utah, and private owners. Most of the corridor lies within the monument, which is managed by the BLM for the purpose of protecting the land's resources. Land uses near and in the communities of Boulder and Escalante include farming, residential, and commercial. The land uses are described in detail below.

Grand Staircase-Escalante National Monument

The Grand Staircase-Escalante National Monument overlays approximately 75 percent of the project corridor and is managed by the BLM. All BLM land is managed for multiple uses, as is evident by the overlapping land use zones, WSAs, and grazing allotment boundaries on Figures 3.3 and 3.4.

Monument Land Use Zones

The BLM manages land according to land use zones described in the BLM's *Grand Staircase-Escalante National Monument Management Plan*. Through the monument, SR-12 is generally surrounded by the Frontcountry land use zone, with a small portion being surrounded by the Primitive land use zone, found on Figure 3.3. The Frontcountry Zone:

> is intended to be the focal point for visitation by providing day-use opportunities in close proximity to adjacent communities and Highways 12 and 89, which traverse the monument. This zone will accommodate the primary interpretation sites, overlooks, trails, and associated facilities necessary to feature monument resources (BLM 1999, 37-38).

Visitor safety is a priority for the Frontcountry Zone.

The Primitive Zone is intended to provide:

> an undeveloped, primitive and self-directed visitor experience without motorized or mechanized access. Some administrative routes are included in the zone, which could allow very limited motorized access to authorized users. Facilities will be virtually nonexistent (BLM 1999).

BLM Grazing Allotments

The BLM administers permits for private livestock grazing on defined areas of public land, referred to as grazing allotments. Nearby state lands are sometimes included in the permit through cooperative agreements. SR-12 is surrounded by BLM grazing allotments. Much of the land surrounding SR-12 is free range for cattle, though fences and natural boundaries prevent cattle from crossing the road in some areas. Ranchers transport cattle in trailers on SR-12 and unload at specific grazing allotments. Ranchers also periodically move cattle on foot between grazing allotments. The frequency of the cattle's movement on foot is estimated to be no more than ten times per year. (Refer to Figure 3.4 for locations of grazing allotments, free-range and fenced areas, and cattle gates.)

BLM Wilderness Study Areas

Within the monument, SR-12 is surrounded by two WSAs, which are adjacent to the edge of the road on both sides. (See Figure 3.3 for detail.) These WSAs bracket approximately 30 percent of

the project corridor and coincide mainly with some/all of the monument's Primitive Zone—though some Frontcountry Zone land near SR-12 is also included. These WSAs are primarily used for outdoor recreation, such as hiking and primitive camping and grazing.

Privately Owned Lands

The west end of SR-12 is within the city limits of Escalante and is zoned for commercial use. Current land use in this area includes residential, farming (e.g., hay and alfalfa), cattle grazing, and privately owned land, including the city of Escalante.

The east end of the project lies within the town limits of Boulder; this area is primarily zoned as greenbelt multiple use with scattered areas of commercial and residential. Greenbelt multiple use zoning is similar to agricultural zoning but with the following differences: the minimum lot size is five acres; residences are allowed on any legal size lot; and some commercial applications are allowed (with restrictions). The land is used for cattle and horse grazing, alfalfa farming, and residential and commercial buildings.

Utah State Institutional Trust Lands

The Utah State School and Institutional Trust Lands Administration (SITLA) owns parcels of land east of Escalante, found on Figure 3.2. This land is used entirely for cattle grazing and has fences or natural boundaries along SR-12 to prevent cattle from crossing the road in these areas.

National Forest

For approximately two miles near Boulder, SR-12 passes through the Dixie National Forest owned by USFS. (See Figure 3.2 for more details.) Dixie National Forest land is used for recreational hiking, camping, hunting, and fishing as well as some logging and minimal grazing.

Farmland

The little farmland that exists on the project corridor is located near the communities of Boulder and Escalante. Some of the farmland is prime farmland and is of state importance, as shown on Figure 3.5.

Impacts

No-Build Alternative

Under the No-Build Alternative, the safety of the monument visitors would not be improved. The No-Build Alternative has no other impacts on the other land uses described above.

Build Alternative

The Build Alternative does not include proposed improvements near Boulder or Escalante, and it will have no permanent land use impacts on forestry land use, commercial or residential land use near Boulder or Escalante, farmlands, or grazing activities.

Under the Build Alternative, some land that is currently within WSAs may be included in the right-of-way application. Stipulations of the right-of-way transfer would ensure the continued protection of any overlapping WSA lands for non-impairment. FHWA would be required to manage any overlapping WSA lands within the transferred right-of-way according to the IMP "so as not to impair the suitability of such areas for preservation as wilderness" (BLM 1995). A conversation with one of the monument's park rangers indicated that 100 feet of right-of-way associated with the Build Alternative would remain within Frontcountry Zone land and would not encroach on lands designated as Primitive Zone land anywhere along SR-12. However, a 200-foot right-of-way may encroach on land protected in both of the WSAs that bracket portions of

SR-12 as it passes through the monument. No new surface disturbances are permitted within WSA lands; therefore, the project will be required to avoid disturbing these areas—even within the right-of-way transfer—and will have no surface disturbing impacts on the WSAs.

According to official BLM maps, there is one proposed improvement—the slow-vehicle turnout at MP 72.5—that is inside a WSA. However, BLM acknowledges a mapping error in this location. From MP 71.9 to MP 73.1, there is a power line on the west side of SR-12. BLM believes this power line was the intended WSA boundary rather than the west edge of SR-12 as shown on their WSA maps. Therefore, BLM supports the position that the proposed slow-vehicle turnout at MP 72.5 does not encroach on a WSA. See email correspondence from Paul Chapman dated January 8, 2008 in Appendix A for more detail.

By improving the safety features of SR-12 as it passes through the monument, the Build Alternative may improve recreational land uses associated with the monument's Frontcountry Zone. See Section 3.2.6 for more detail.

Temporary Construction Impacts

Temporary impacts to land use along the project corridor may occur during construction. These impacts could include traffic delays or restrictions that cause problems with accessibility, including difficulties with moving cattle between grazing allotments or accessing recreational facilities within the monument.

Mitigation

Impacts to WSAs that would impair their suitability for preservation as wilderness will be prevented through special conditions or stipulations of the right-of-way transfer. If and when Congress designates these areas as wilderness, the right-of-way line can be included in wilderness legislation. It will be up to Congress to determine whether the wilderness area boundary will coincide with the right-of-way line.

Mitigation for short-term impacts to traffic during construction is discussed in Section 3.2.2.

3.2 SOCIAL IMPACTS

3.2.1 Community Character and Cohesion

Affected Environment

The proposed project area largely consists of the 26.5-mile segment of SR-12 that winds through undeveloped land of the monument, linking Escalante on the west end of the project to Boulder on the northeast end of the project. SR-12 is a narrow, winding road with a rural, undeveloped character that complements the scenic landscape. This road, in its current configuration, has linked Boulder and Escalante since 1940. SR-12 is the primary route used by citizens of Boulder to access more available goods and services in Escalante, and it facilitates the flow of recreational traffic and tourists between the two towns and through the monument as a whole. Therefore, this stretch of SR-12 is a critical component of the Escalante-Boulder greater community and of the monument.

Town of Boulder

Known as the "last frontier in Utah," the town of Boulder was settled in the late 1800s. Boulder, a cattle-ranching community, was the last town in the United States to receive mail by mule and

was the most isolated town in Utah until 1940 when SR-12 was built, connecting Boulder to Escalante. In 2006, the population of Boulder was 178, and the character of Boulder is still that of a rural town. Boulder offers its citizens many services, such as a library, post office, elementary school, volunteer fire department, Latter Day Saints (LDS) churches, and a cemetery. However, Boulder residents generally travel along SR-12 to Escalante to attend high school (grades 7 – 12) and non-LDS churches and to access medical clinic services, banking services, automobile repair, and other retail goods and services that are not available in Boulder. This need for important services not offered in Boulder ties the two communities together and creates a larger Escalante-Boulder community.

Escalante City

Escalante City was settled in 1876. In contrast to Boulder, Escalante has seen more population growth—documented as 750 in 2006 by the U.S. Census Bureau—that has resulted in faster development of both residential and commercial properties. As a result, the character of Escalante is more city-oriented than Boulder, as measured in its characteristics like more traffic; an established street grid with curbs, gutter, sidewalks, and street lighting; and a wider range of services and retail establishments.

Impacts

No-Build Alternative

The No-Build Alternative would result in no direct impacts on the character or cohesion of SR-12, on either of the individual communities of Boulder or Escalante, or on the Escalante-Boulder greater community and monument users. However, these communities would experience negative indirect impacts over time under the No-Build Alternative. Continued deterioration would eventually result in road or bridge failure. Without an alternate transportation route, these communities would be isolated until emergency repairs could be completed.

Build Alternative

The Build Alternative may have long-term positive impacts on the cohesion of the greater Escalante-Boulder community and monument users by preventing road failures that could be caused by deteriorating infrastructure. The Build Alternative includes stabilizing the roadway at three locations and a bridge replacement. This project will extend the life of the road and reduce the possibility of road closures or restrictions due to failures.

The Build Alternative would not have any other long-term impacts on the character or cohesion of the individual communities of Escalante or Boulder, the greater Escalante-Boulder community, or monument users.

Mitigation

Because the project would not have negative impacts on community character and cohesion, no mitigation is required.

3.2.2 Travel Patterns and Accessibility

Affected Environment

As described in Section 3.2.1, SR-12 is a critical facility for travel between Boulder and Escalante for both local commuters and for monument visitors. The only other option for travel from Boulder to Escalante is "Hell's Backbone Road," which is unpaved and not traversable in winter. It is less safe and has a longer travel time and distance than SR-12.

Local residents of Escalante and Boulder rely on the corridor to access work, school, after-school activities, services, rangeland, recreation, and other activities in either town. Visitors to the monument use this facility to travel between the two communities and to access popular viewpoints and recreational areas that lie along the corridor. Local commuter travel can be slowed or obstructed during high tourism periods when visitors to the monument are traveling slowly or stopping at viewpoints, trailheads, and recreation-area turnoffs.

Within the project area, there are a number of facilities used by local residents that are only accessible from SR-12, including the Escalante Airport and the sawmill, Skyline Forest Resources. Skyline Forest Resources is one of the largest employers in Escalante. There are also several private businesses and property owners along the corridor that can only access their properties from SR-12.

Impacts

No-Build Alternative

The No-Build Alternative would result in no direct impacts to travel patterns or accessibility. However, travel patterns and accessibility would be indirectly impacted by continued deterioration. Without necessary maintenance improvements, the roadway and bridge would eventually fail. Without an alternate route, travel between Escalante and Boulder would be extremely difficult until emergency repairs could be completed. To get from Escalante to Boulder, travelers would have to take Hell's Backbone Road, which is impassible in the winter, or take a 200-mile detour through Panguitch and Loa.

Conflicts between vehicles traveling at different speeds would remain. It would continue to be difficult to safely pass slow-moving vehicles. Conflicts between vehicles turning at the Calf Creek Recreation Area and Hole-in-the Rock Road would not be addressed.

Build Alternative

The Build Alternative would improve travel patterns and accessibility along the corridor by creating slow-vehicle turnouts and improving intersections at the Calf Creek Recreation Area and at Hole-in-the-Rock Road, all of which promote the unimpeded free flow of traffic while still accommodating recreational and sightseer travel patterns. The Build Alternative would also improve accessibility and travel patterns by preventing road closures and restrictions due to slope failures.

Temporary Construction Impacts

The Build Alternative would result in short-term impacts to travel patterns and accessibility during construction periods due to temporary travel interruptions and lane restrictions, where practical. These will be minimized through work scheduling and timing to avoid peak commute or tourism periods, where practicable.

If Option 2—Retaining Wall is selected for roadside stabilization at mile post (MP) 75.4, the wall would need to be constructed from above because there is a WSA at the existing toe of slope on the west side of the road and construction equipment is prohibited from being used on a WSA. This restriction would result in longer construction impacts than Option 1—Rock Removal due to lengthier lane closures.

Mitigation

Construction schedules and practices will maintain connectivity and access through the corridor to the maximum extent possible. The road will remain open to traffic at all times unless closure is approved by the resident engineer—for example, during blasting operations. Utah Department of Transportation (UDOT) standards for traffic control management will be implemented to coordinate the efficiency and safety of construction activities throughout the duration of the project. These standards include the following:

- The contractor will work with the local communities, UDOT, and BLM to develop a schedule and communication plan that reduces impacts to the accessibility of recreational resources, grazing allotments, residences, and businesses. The plan will evaluate the best time to perform blasting operations based on the benefits and impacts.
- The construction schedule will minimize impacts during peak tourist visitation periods and school and business commutes to the maximum extent possible. Specific times for construction restriction will be established through coordination with the local community.
- Advanced notice will be given for all road closures and lane restrictions.
- Information about the construction schedule and activities will be made available at various tourist facilities, such as visitor centers and hotels.

3.2.3 Relocations and Right-of-Way

Affected Environment

There are only a few residences and business adjacent to SR-12 between Escalante and Boulder. These are mostly concentrated at the east end of Escalante and the south end of Boulder, with a few located on privately owned land near the Escalante River crossing. None of these residences or businesses is located in areas impacted by proposed spot improvements shown on Figure 3.1.

The right-of-way between Escalante and Boulder varies because SR-12 crosses private, state, and federal lands. Existing rights include fee simple ownership, easements, prescriptive rights—meaning rights acquired over private lands through use—and Revised Statute (RS) 2477.

Impacts

No-Build Alternative

The No-Build Alternative would not result in any relocations or right-of-way acquisition. The existing RS-2477 right-of-way would remain valid, and the right-of-way width would remain ambiguous. Due to the political nature of the area, UDOT maintenance crews would still face frustration regarding what activities are acceptable. Unless the right-of-way is clarified, all interested parties (e.g., UDOT, BLM, and the public) would continue to question whether and what type of maintenance activities are appropriate.

Build Alternative

The Build Alternative would not result in the relocation of existing residences or businesses or any modification to their accesses.

The Build Alternative would result in approximately 351.5 acres of Title 23 federal land transfer. Proposed right-of-way is shown on Figure 2.2; a detailed discussion is available in Section 2.5.1.

The entire requested right-of-way is on BLM land within the Grand Staircase-Escalante National Monument. BLM would transfer the land to the Federal Highway Association (FHWA); FHWA would then grant a highway easement to UDOT. UDOT is not requesting right-of-way from any other federal or state agency or private landowner.

BLM has recommended that UDOT apply for an appropriate right-of-way width throughout the corridor. The 100-foot half width that UDOT is requesting may overlap with WSA lands in some locations. However, it is difficult to determine the overlap because the exact locations of these WSAs have not been precisely delineated on the ground and surveyed.

A summary of the needed right-of-way is shown in Table 3.1. Approximately 346 acres would be transferred for the highway corridor. The corridor would generally be 200-feet wide, with wider areas where the existing toe of slope extends beyond a 200-foot corridor. The remaining 5.5 acres would be transferred for one stockpile site.

Table 3.1: Transferred Right-of-Way

Location	Mile Post	Description	Acres of Right-of-Way Transferred
SR-12 Corridor	68.9 – 83.1	200 Foot-Wide Corridor (Generally)	346
Previously disturbed stockpile area on New Home Bench (east side of road)	82.1	Stockpile Site	5.5
		Total	**351.5**

It is not possible to accurately calculate the difference between the existing right-of-way and the requested right-or-way because the RS-2477 boundaries have never been precisely delineated. Likewise, it is not possible to accurately calculate the acreage of right-of-way requested within WSAs because the WSA boundaries have never been precisely delineated. Coordination with BLM regarding right-of-way is ongoing and will continue through the decision process for this environmental document. Special conditions or stipulations for the right-of-way transfer will address the overlapping WSAs.

The Build Alternative would result in more efficient and proactive roadway maintenance:

- Existing drainage facilities—e.g., culverts and ditches—would be cleaned more frequently and would function as designed. Erosion caused by storm runoff not flowing through ditches and culverts as intended would be reduced.
- Maintenance costs would be reduced. The distance to haul material to and from the site would decrease because a stockpile area would be available along the corridor.
- By using material that blends in with the surrounding area, maintenance activities could be more aesthetically pleasing. It would be possible to stockpile native material for use in appropriate locations.
- Eroding embankment and deteriorating barriers would be maintained routinely, rather than in reaction to an emergency situation.
- Surface disturbances within the right-of-way would increase with more frequent maintenance. Surface disturbances inside WSAs would not increase.

Mitigation

Mitigation is not required for relocations because the project would not result in any relocations.

Mitigation for right-of-way will be addressed through special conditions or stipulations for the federal land transfer from BLM. Stipulations of the right-of-way transfer would ensure the continued protection of any overlapping WSA lands for non-impairment. First, BLM would transfer the requested right-of-way to FHWA. Then, FHWA would be required to manage any overlapping WSA lands within the transferred right-of-way according to the IMP "so as not to impair the suitability of such areas for preservation as wilderness" (BLM 1995). Because the underlying land would remain federal land, FHWA would be required to insure non-impairment through stipulations of the grant for a highway easement deed to UDOT.

3.2.4 Public Facilities and Services

Affected Environment

Most public facilities and services in Boulder and Escalante rely on SR-12, including resident county sheriff personnel, volunteer emergency medical technicians (EMTs), and ambulances. In addition, the Escalante High School, Escalante Cemetery, and Escalante Airport lie along SR-12.

The ambulances transport patients to the hospital in Panguitch, which requires Boulder ambulances to travel on SR-12. Additionally, SR-12 connects the residents of Boulder to other public services provided in Escalante, including the high school for grades 7–12 and the medical clinic.

Impacts

No-Build Alternative

No public facilities or services would be impacted by the No-Build Alternative. However, public services and facilities would be indirectly impacted by continued deterioration. Without necessary maintenance improvements, the roadway and bridge would eventually fail. Because there is no alternate route, this failure would make travel between Boulder and the hospital in Panguitch more difficult; travel would be more time-consuming until emergency repairs could be completed. To get from Boulder to Panguitch, ambulances would have to take Hell's Backbone Road, which is impassible in the winter, or take a 50-mile detour through Loa. This detour would add approximately 45 minutes to the trip.

As discussed in Section 3.2.2, travel between Escalante and Boulder would be extremely difficult if the road failed. The school bus would have to travel Hell's Backbone Road, which is impassible in the winter, or take a 200-mile detour two times a day. Per day, the detour would result in an eight-hour increase in time spent on the bus.

Build Alternative

There would be no impacts to public facilities under the Build Alternative since no construction or other changes are proposed for the portions of SR-12 adjacent to public facilities. However, once construction is complete, there may be an overall improvement to the accessibility and timeliness of services between Escalante and Boulder due to improvements in traffic flow along SR-12.

Temporary Construction Impacts

Under the Build Alternative, there may be short-term impacts to public services, especially to ambulance travel through the corridor and to high school bus service, due to construction-related travel restrictions or delays on SR-12 between Boulder and Escalante.

Mitigation

Mitigation for short-term impacts to traffic during construction is discussed in Section 3.2.2.

3.2.5 Utilities

Affected Environment

Utilities within the project limits are limited to overhead power lines that roughly parallel SR-12, crossing state, federal, and private land. There are two sets of power lines—a larger transmission line running from Escalante to Boulder and a smaller transmission line running roughly parallel to the larger one from Escalante but terminating at the Calf Creek Recreation Area. The major transmission line is shown on Figure 3.3. The smaller transmission line has not been mapped.

Impacts

No-Build Alternative

No utilities will be impacted by the No-Build Alternative.

Build Alternative

No utilities will be impacted by the Build Alternative.

3.2.6 Recreation Resources

Affected Environment

The study area for recreation resources is a corridor approximately a quarter of a mile wide surrounding SR-12 from MP 63 to MP 85; the study area includes all areas where improvements under the Build Alternative are proposed.

Recreational opportunities and related tourism represent one of the primary resources in the project area and the Grand Staircase-Escalante National Monument region in general. Recreation resources that lie within the SR-12 project limits consist of trailheads (official and unofficial), interpretive overlooks and waysides, Calf Creek Recreation Area, Hole-in-the-Rock Road, camping areas, and parking areas associated with these resources. Information kiosks and the multi-agency Escalante Visitor Center are located on SR-12, just outside the project limits, found on Figure 3.6. In addition to these site-specific facilities, the road itself is a recreation-related destination because of its historic, aesthetic, and visual value. SR-12 is a Scenic Byway and a federally designated All-American Road. For this reason, the motoring and cycling public use the project corridor for traveling to other destinations and for viewing the project area itself. Touring companies (e.g., bus, motorcycle, and bicycle) operate within the project limits and beyond.

The *Scenic Byway 12 Signage and Interpretive Master Plan* is a comprehensive interpretative plan based on resource strategies identified in the *Scenic Byway 12 Corridor Management Plan*. Table 3.2 provides a brief description of existing and planned recreation resources that lie along the corridor.

Table 3.2: SR-12 Recreation Resources

Recreation Facility	BLM MP*	Current Description	Future Description
Hole-in-the-Rock Wayside	64.3	Paved wayside on east side of SR-12, eight-car capacity, one interpretive panel.	Move to west side of SR-12 in conjunction with upgrade of Hole-in-the-Rock Road intersection by UDOT (location to be determined), separate from SR-12 with median.
Hole-in-the-Rock Road	64.4	Turnoff to 50-mile dirt road, providing access to historic features—hiking and horse-packing, trails and slot canyons. Ends at site of historic pioneer passageway.	No planned changes by BLM. UDOT Build Alternative improves intersection by adding turn lanes.
Head of the Rocks Wayside	69.3	Paved pullout, undefined parking with 20-car capacity, one interpretive panel.	Improve wayside, separate from SR-12 with median, marked parking stalls, paved viewing area with retaining wall, series of panels.
Boynton Overlook Wayside	73	Paved wayside, seven-car undefined parking, one interpretive panel.	Two options under consideration: minimal improvement or expansion to day-use area.
Escalante River Trailhead	73.9	Trailhead, ten-car undefined parking, portable toilet, trail register. Frequent overflow parking onto SR-12.	Redesign by BLM to define parking, provide permanent toilet, improve signage, and discourage overflow parking on SR-12.
Calf Creek Recreation Area	75	Campground, 25-car parking, restrooms, trailhead. Access road requires tight turn onto SR-12.	BLM to improve parking lot, discourage overflow parking on SR-12.
Hogsback Wayside	79	Paved wayside with five to seven car capacity, one interpretive panel.	Discourage use by removing signage and interpretive panel. Reinforce edge of pullout to prevent erosion.
Hogsback Day Use Area	80.3	No facility currently.	New site to be built on west side of SR-12 as day-use area with parking, toilets, interpretive trail, and picnic tables.
Hell's Backbone Wayside	83.3	Undefined pullout at intersection of Hell's Backbone Road, one interpretive panel.	Construct defined paved wayside, install new panel.
Boulder Overlook Wayside	85.5	Large gravel wayside with ten-car capacity, one interpretive panel.	Pave wayside, add median between wayside and SR-12, define parking, add overlook platform.
Escalante Town Trailhead	60.0	Trailhead	N/A.
Upper Calf Creek Falls Trailhead	83.5	Trailhead	N/A.
Burr Trail Wayside	86.5	One interpretive panel at junction of Burr Trail Road and SR-12.	Remove interpretive panel, move messages to the town kiosk behind the community center.

Source: BLM, no date(b) and BLM 1999

Impacts

No-Build Alternative

Under the No-Build Alternative, the *Scenic Byway 12 Signage and Interpretive Master Plan* would still be implemented. Planned improvements to the waysides listed in Table 3.2 would still be constructed.

The No-Build Alternative would not result in direct impacts to the recreational facilities listed in Table 3.2. However, there would be indirect impacts at two locations:

- Hole-in-the-Rock Road. The intersection would not be improved and the accident rate would continue to be higher than average at this location.
- Calf Creek Recreation Area. The intersection would not be improved and large vehicles would continue to cross the centerline to make the tight turn into the recreation area.

The No-Build Alternative would also result in indirect impacts to the road itself—a recreation-related destination. Under the No-Build Alternative, unstable Jersey barriers would continue to deteriorate. The roadway supporting the barrier would continue to slough off, and the barriers would become askew. The result would be both unattractive and unsettling for recreational travelers. Without necessary maintenance improvements, the roadway and bridge would eventually fail. Without an alternate route, emergency repairs would be necessary and context sensitive or aesthetic considerations may not be possible.

Build Alternative

The Build Alternative would result in positive indirect impacts to recreation resources by improving safety and accessibility at the following recreational features and locations:

- Hole-in-the-Rock Road—Improved Intersection. The Build Alternative would provide turning lanes so through traffic would not be impeded by vehicles turning onto or off of Hole-in-the-Rock Road. This is expected to reduce the number of accidents at this location.
- Calf Creek Recreation Area—Improved Intersection. The Build Alternative would provide turning lanes so through traffic is not impeded by vehicles turning onto or off of Calf Creek Recreation Area. Shifting the road to the east would improve the geometry for westbound vehicles turning into the recreation area because they would not need to cross the centerline to make the tight turn.

The Build Alternative would beneficially impact these two recreation resources and would not negatively impact any recreation resources. The Build Alternative would also beneficially impact the road itself—a recreation-related destination. Failing infrastructure would be maintained or replaced, resulting in a more attractive and comfortable setting for the recreational traveler. In locations where unstable concrete Jersey barriers are stabilized, aesthetic barriers would be used. (See Section 3.17 for more detail.)

Temporary Construction Impacts

During construction, the Build Alternative would have short-term impacts to the accessibility of the two recreation resources listed above.

Mitigation

Mitigation for short-term impacts to traffic during construction is discussed in Section 3.2.2. Mitigation for visual quality is discussed in Section 3.17.

3.2.7 Environmental Justice Populations

Regulatory Setting

All projects involving a federal action—such as funding, permit, or land—must comply with Executive Order (EO) 12898 Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, signed by President Clinton on February 11, 1994. This directs federal agencies to take the appropriate and necessary steps to identify and address a federal project's disproportionately high and adverse effects on the health or environment of minority and low-income populations to the greatest extent practicable and permitted by law. Minority is defined in EO 12898 as Black or African American, American Indian or Alaskan Native, Asian, Native Hawaiian or Pacific Islander, or Hispanic. Low income is defined based on the Department of Health and Human Services poverty guidelines.

The Federal-Aid Highway Act of 1970: 23 USC 109(h) establishes guidelines for compliance with the environmental justice component of the National Environmental Policy Act (NEPA). The effort to prevent discrimination must address but not be limited to a program's impacts, access, benefits, participation, treatment, services, contract opportunities, training opportunities, investigation of complaints, allocation of funds, right-of-way, research, planning, and design.

The guidelines state that all proposed projects approved by the Secretary of Transportation shall take into consideration the need for fast, safe, and efficient transportation and public services as well as the costs of eliminating or minimizing any adverse effects. The Secretary shall also take into consideration the following:

- Air, noise, and water pollution
- Destruction or disruption of man-made and natural resources, aesthetic values, community cohesion, and the availability of public facilities and services
- Adverse employment effects and tax and property value losses
- Injurious displacement of people, businesses, and farms
- Disruption of desirable community and regional growth

Affected Environment

The project area for the environmental justice evaluation includes the communities of Escalante and Boulder. An evaluation of census data from the 2000 census as well as 2005 to 2006 school enrollment data from the National Center for Education Statistics was conducted to identify concentrations of minority and low-income populations. Concentrations of these populations are identified by evaluating demographic data; this evaluation is used to determine whether any particular group is present at a rate that is "meaningfully greater" than the same group in a larger comparison region.

The proportion of a population group is said to be "meaningfully greater" at the local level if it is present at a rate that is at least 50 percent greater than the proportion of the same population

group in a comparison region. Garfield County was used as the comparison region in this evaluation.

The data indicates that minority and low-income populations exist in the project area, as shown in Table 3.3. The percentages displayed in Table 3.3 indicate the proportion of each population group as a percentage of the total population in that area. The percent difference between the local area and the comparison region is shown in parenthesis. Areas that exceed the 50 percent level are shown in bold.

Evaluation of school enrollment data suggests that Escalante City may also have a concentration of Hispanic residents that is meaningfully greater than the proportion of Hispanic residents in Garfield County as a whole. Similarly, the census data suggests that Escalante City, in comparison to Garfield County, has a meaningfully greater proportion of families that are below the poverty level and have children under 18, a female house holder, and/or no husband present. This data was excluded from Table 3.3 to maintain simplicity.

Table 3.3: 2000 Census Data Used in Environmental Justice Evaluation

Category	Comparison Region		Local Areas			
	Garfield County		Escalante City		Boulder Town	
Race and Ethnicity						
Total Population	4,735	100.0%	818	100.0%	180	100.0%
One Race	4,665	98.5%	797	97.4% (-1.1%)	176	97.8% (-0.8%)
White	4,496	95.0%	768	93.9% (-1.1%)	174	96.7% (1.8%)
Black or African American	8	0.2%	0	-	0	-
American Indian and Alaska Native	87	1.8%	19	2.3% (26.4%)	0	-
Asian	19	0.4%	8	1.0% (143.7%)	2	1.1% (176.9%)
Native Hawaiian and Other Pacific Islander	2	0.0%	0	-	0	-
Some Other Race	53	1.1%	2	0.2% (-78.2%)	0	-
Two or More Races	70	1.5%	21	2.6% (73.7%)	4	2.2% (50.3%)
Hispanic or Latino (of Any Race)	136	2.9%	33	4.0% (40.5%)	2	1.1% (-61.3%)
Income						
Total Families	1,214	100.0%	218	100.0%	46	100.0%
Individuals Below the Poverty Level	374	7.9%	90	11.0% (39.3%	24	13.3% (68.8%)
Families Below the Poverty Level	74	6.1%	12	5.5% (31.0%)	7	15.2% (262.2%)

Source: U.S. Census Bureau, no date(a)

Impacts

No-Build Alternative

The No-Build Alternative would not result in disproportionate adverse impacts to the identified minority populations.

Build Alternative

The Build Alternative would not result in disproportionate long-term adverse impacts to the identified minority populations. However, the Build Alternative would result in long-term improvements to the corridor that would be experienced by all populations who travel along SR-12.

Temporary Construction Impacts

Construction associated with the Build Alternative could pose short-term impacts due to commuting delays that may affect high school students going to and from class and after-school activities. It could also cause commuting delays for other residents that travel between the two communities for work or other services.

These impacts will affect all travelers along SR-12, not just the environmental justice population. As such, no disproportionate impacts to the environmental justice population will occur.

Mitigation

Mitigation for short-term impacts to traffic during construction is discussed in Section 3.2.2.

3.3 ECONOMICS

Affected Environment

Garfield County is highly dependent on tourism and recreation, with approximately 28.5 percent of jobs in 2007 categorized as "Leisure and Hospitality" (DWS, no date). The Escalante-Boulder area supports a slightly broader range of businesses and services, with tourism, government, schools, timber processing, and telecommunications all providing a strong foundation for the local economy. The three largest employers located in the Escalante-Boulder area, accounting for about 30 percent of the local workforce, include the following:

- South Central Communications. This phone company has 124 employees in south central Utah, of which approximately 31 are from Escalante and two are from Boulder.
- Skyline Forest Resources Inc. This sawmill in Escalante currently employs approximately 55 employees, largely from Escalante.
- Various Elementary and Secondary Schools. Elementary and secondary schools employ about 35 people in Escalante and seven people in Boulder.

Recreation and Tourism

The economy of Boulder and Escalante is dependent on tourism to the Grand Staircase-Escalante National Monument. According to the employer data maintained by the Department of Workforce Services (DWS), tourism-related businesses in Escalante and Boulder—such as hotels, motels, restaurants, etc.—employ approximately 100 people or about 25 percent of the local workforce.

According to the Utah Office of Tourism, well over 600,000 people visit the monument every year. An extensive survey of visitors between March and October 2004, as reported in the *Grand Staircase-Escalante National Monument Front Country Visitor Study*, found that the majority of visitors to the monument were from states other than Utah (63 percent) or were from outside of the United States (23 percent). Approximately 36 percent of the monument visitors noted that they stayed in local motels or bed-and-breakfast facilities in and around the monument during their visit to the area with an average stay of 2.8 nights. It is estimated that total expenditures by

visitors to the monument are in excess of $20 million per year, supporting tourism-related employment of about $10 million per year in Garfield and Kane counties.

Economic Indicators

Based on available information regarding unemployment rates, housing prices, and the business economy, it appears that Boulder and Escalante are similar to the rest of Garfield County with slightly lower household incomes and higher unemployment rates than the state average. Boulder and Escalante, however, have slightly higher median home prices than the Garfield County average, probably reflecting their desirable location adjacent to the monument.

Table 3.4: Economic Indicators for Local Towns, County, and State

	Boulder	Escalante	Garfield County	Utah
2000 Population	180	818	4,735	2,233,169
2006 Population	178	750	4,534	2,550,063
2006 Annual Unemployment Rate	Not Available	Not Available	4.9%*	2.9%*
Population Percentage in Labor Force (2000)	68.7%	59.9%	63.6%	69%
Number of Employers (2005)	23*	35*	Not Counted	Not Counted
Number of Tourism-Related Employers	7*	10*	Not Counted	Not Counted
Median Household Income (2000)	$30,000	$32,143	$35,180	$45,726
Median Home Price (2000)	$92,500	$100,600	$90,500	$146,100
Local Property Tax	8%**	10.5%**	N/A	N/A

Source: U.S. Census Bureau, no date(a)
**Source: DWS, no date*
***Source: Utah Tax Commission, no date*

Impacts

No-Build Alternative

No direct economic impacts are expected to result from the No-Build Alternative. However, the economics of Boulder and Escalante may be indirectly impacted if the roadway fails and commuters seek goods and services elsewhere.

Build Alternative

No economic impacts are expected to directly result from the Build Alternative. While the safety improvements of the proposed project may make corridor travel more comfortable for visitors, there is no evidence that current road conditions are discouraging or restricting visitation. Therefore, no increases to tourism in the area are expected as a result of the Build Alternative.

The Build Alternative could have negative short-term economic impacts during construction if travel delays or restrictions create significant problems for travelers.

Mitigation

Mitigation for short-term impacts to traffic during construction is discussed in Section 3.2.2.

3.4 PEDESTRIAN AND BICYCLIST CONSIDERATIONS

Regulatory Setting

Bicycle Transportation and Pedestrian Walkways Legislation calls for the integration of bicycling and walking into the transportation mainstream. FHWA encourages the development and

implementation of bicycle and pedestrian plans as part of the overall transportation planning process and helps coordinate efforts of federal, state, metropolitan, and other agencies to improve conditions for bicycling and walking.

In addition, Title II regulations under the Americans with Disabilities Act (ADA) of 1990 requires UDOT to apply specific access design standards, developed by the U.S. Access Board, when constructing or altering pedestrian facilities. For instance, the ADA accessible guidelines, outlined in the *Americans with Disabilities Act Handbook,* call for curb ramps to be provided wherever an accessible route crosses a curb.

In 1991, Congress passed landmark transportation legislation—the Intermodal Surface Transportation Efficiency Act (ISTEA)—that recognized the increasingly important role of bicycling and walking in the creation of a balanced, intermodal transportation system.

While pedestrian and bicyclist issues were being evaluated for this environmental assessment, the above factors and other design guidelines were considered. See Chapter 2 for a description of the alternatives analysis process as it relates to considerations for pedestrians and bicyclists.

Affected Environment

The project area for pedestrian and bicyclist considerations includes SR-12 between Escalante and Boulder and trailheads accessed via SR-12. This project area and associated trailheads are depicted on Figure 3.6. Within Escalante, both sides of Main Street and the north section of SR-12 between 300 East and Escalante High School have sidewalks. Outside Escalante City, there are no established walking or bicycle paths on or along SR-12. There are also no sidewalks present along SR-12 in Boulder. SR-12 itself is used on a limited basis by both pedestrians and bicyclists.

Pedestrians use SR-12 primarily at established recreation areas, including waysides, trailheads, and at the Calf Creek Recreation Area. (See Table 3.2 for a listing of recreation resources). At waysides, pedestrians walk from their vehicles to view points or other significant features along the roadway. In these locations, the duration of pedestrian activity is limited and dispersed. At trailheads and at the Calf Creek Recreation Area, pedestrians are present at higher frequencies and for longer durations. In general, when pedestrians are present at trailheads, they are either arriving for a hike or returning to their vehicles after a hike.

Based on information collected at the Context Sensitive Committee (CSC) meetings—described in Chapter 6—a small but growing population of cyclists travels the SR-12 corridor between the communities of Escalante and Boulder as well as points beyond. Several outfitters operate in the area, providing rental bikes and guided tours of local trails. Guided tours generally use trails but may use SR-12 on an infrequent basis. No formal estimate is available for the number of bicyclists who use the corridor annually. Each season, several groups of up to 20 cyclists will travel through the project area along SR-12 as part of a cross-country tour. Similar to pedestrian use, bicyclists are present at waysides, trailheads, and the Calf Creek Recreation Area. Bicyclists using waysides are typically traveling long distances and use waysides for rest stops. Bicyclists present at campgrounds include both long-distance travelers and campground users with bikes who are traveling by vehicle but use their bikes for short-distance recreation at and around the campgrounds. Some local cyclists travel along the corridor to Kiva Coffee or to trailheads.

There are no developed mountain bike trails in the immediate vicinity of SR-12, and mountain biking is not permitted on hiking trails. Mountain biking is permitted on all paved and non-paved roads in the monument.

Impacts

No-Build Alternative

If the No-Build Alternative is implemented, indirect impacts are expected to result from perpetuating current deficiencies. For example, as the existing shoulders continue to erode due unstable side slopes, the available space for pedestrians and bicyclists will be diminished. Similarly, as the population of monument users grows, which includes pedestrians and bicyclists, the need for alerting motorists of pedestrian and bicyclist presence with signing will also grow. Without implementing an improved signing program that addresses this need, safety concerns for pedestrians and bicyclists will increase.

No direct impacts are anticipated as a result of the No-Build Alternative.

Build Alternative

The Build Alternative would improve safety and visibility for pedestrians and bicyclists because a signing program would be developed and the erosion of shoulder space used by pedestrians or cyclists would be halted or delayed. The widening of shoulders at the Calf Creek Bridge associated with bridge replacement and at other areas in conjunction with spot improvements would also improve safety for bicyclists.

Temporary Construction Impacts

Short-term construction impacts related to the Build Alternative would occur in construction zones and may affect any pedestrians or bicyclists present in these zones during construction. Potential construction impacts would include increased noise, fugitive dust, travel delays, and travel restrictions. Bicycle use will be discouraged during construction. This may impact outfitters through a potential reduction in rentals or sales of guided tours during construction periods. These impacts would be temporary.

Mitigation

During final design, UDOT will develop a comprehensive signing plan that evaluates creative approaches to signing for shared bicycle use. Examples of such approaches used in other canyon environments include push button signs that read, “Bikes present in canyon when flashing.”

For temporary construction impacts, UDOT Standard Specification 01554 Traffic Control will be included in the contract documents and will direct the contractor to provide for the safe passage of pedestrians and bicyclists through the work zone.

Bicycle use will be discouraged during construction. To mitigate impacts to cyclists and pedestrians, information about the construction schedule will be placed in public spaces frequented by tourists and cyclists. Advance notice for construction activities that result in road closures will be provided to outfitters and local businesses.

3.5 AIR QUALITY

Regulatory Setting

The Clean Air Act

Consistent with NEPA—further detailed in 23 Code for Federal Regulations (CFR) 771—projects must be evaluated for potential human environment air quality impacts. Additionally, the Federal Clean Air Act (CAA) has established specific procedures and limitations for evaluating transportation projects in designated air quality non-attainment areas. These procedures, generally referred to as "conformity regulations," are outlined in the CAA and are further detailed in 40 CFR 93. Although separate from the NEPA process, the conformity regulations also require a review of the potential transportation air quality impacts on the human environment. Both NEPA and CAA project level analysis apply National Ambient Air Quality standards (NAAQs) to the relevant pollutants as the criteria for evaluating proposed projects and actions.

Affected Environment

The Environmental Protection Agency (EPA) has identified six criteria pollutants for which specific air quality standards apply: particulate matter (PM10), carbon monoxide (CO), ozone (O3), nitrogen dioxide, sulfur dioxide, and lead. The two pollutants that are most directly attributable to motor vehicles and are of most concern in Utah's transportation planning and environmental permitting process are CO and PM10.

Carbon Monoxide

While a vast majority of carbon monoxide can be attributed to motor vehicles, industrial processes—such as metals processing, forest fires, wood stoves, and even cigarette smoke—are additional sources of carbon monoxide emissions. Significant changes in other emission sources combined with changes in travel patterns and transportation networks might affect carbon monoxide at a regional level. However, the effects of any individual project are likely to be small and uncertain.

Particulate Matter

In Utah, PM10 has a strong regional component. Utah's climate and geography contribute to PM10's regional impacts. An example of this is temperature inversions, which cause particles to become trapped in mountainous valleys. In the southwestern portion of Utah, this trend is less severe because the area is lower in elevation. Furthermore, the Colorado River provides an outlet for cool air, which reduces the amount of inversion during winter months.

Garfield County currently does not exceed any of the six transportation-related criteria pollutants and therefore Garfield County is in attainment. The current *Grand Staircase-Escalante National Monument Final Environmental Impact Statement* (FEIS) indicates that ambient pollutant levels are "near or below the measurable limits," in and around the monument, which includes the entire SR-12 project area. Based on conversations with the Division of Air Quality (DAQ), the general climatic and meteorological conditions in the project area are not a concern for the proposed SR-12 project.

Mesoscale Analysis

Mesoscale analysis refers to regional-scale evaluation. Generally, a conformity determination is the heart of mesoscale analysis. Because the project area is considered to be in attainment and is not a maintenance area for any of the transportation-related pollutants, there is no requirement for mesoscale analysis of CO or PM10.

Microscale Analysis

Microscale air quality analyses deal mostly with localized MO and PM10 emissions from the project. Such microscale analysis is typically referred to as hot spot analysis. FHWA has approved of quantitative hot spot analysis methods for evaluating the localized CO impacts of transportation projects and of qualitative methods for evaluating PM10 impacts. Since the SR-12 project is an attainment area, the primary purpose of NEPA's project level requirements is to state with certainty that the project will not cause air quality standards to be exceeded.

Impacts

No-Build Alternative

No air quality impacts are expected to result from the No-Build Alternative.

Build Alternative

Because the project area is in attainment for the six CAA transportation-related criteria pollutants, the conformity regulations are not applicable to this project. NEPA, however, requires the disclosure of project impacts to air quality.

The impacts of highway operation on regional air quality would be long-term and directly related to traffic volumes and average speeds. An increase in traffic volumes and average speeds combined with meteorological and land use changes might affect air quality at a regional level. However, the effects of any individual project are likely to be small and uncertain.

Based on exhaustive sensitivity testing done for UDOT, it has been determined that traffic volumes less than 50,000 average daily traffic (ADT) do not cause carbon monoxide levels to increase to the point of violating air quality one-hour or eight-hour standards. This project's anticipated future (the year 2030) ADT volumes are 2,460 so no violation of the carbon monoxide standard is anticipated.

Temporary Construction Impacts

The impacts of construction activity would be temporary and primarily associated with fugitive dust from construction activities.

If Option 1—Rock Removal is selected for roadside stabilization at MP 75.4, the rock removal would require blasting operations. In addition to the dust caused by standard construction methods and heavy machinery, the blasting would result in increased dust during construction. However, blasts would be intermittent due to setup and debris removal requirements. Option 2—Retaining Wall would only result in the increased dust from standard construction and heavy machinery; no additional dust besides that caused by standard construction would result from the retaining wall option.

Mitigation

Temporary impacts from fugitive dust will be mitigated through the application of UDOT Standard Specification 01355 Environmental Protection, which sets standards for fugitive dust control and visible emissions. In addition, any "non-permitted" equipment—such as a concrete batch plant, asphalt plant, or rock crushing plant—located at the construction site will require an Air Quality Approval Order (AQAO) and a fugitive dust control plan.

3.6 NOISE

Regulatory Setting

FHWA has adopted and published noise abatement criteria for highway construction projects. These standards are found in Procedures for Abatement of Highway Traffic Noise and Construction Noise Legislation (23 CFR 772), dated September 18, 1982. The standards provide definitions and abatement criteria for use in the planning and design of highways approved pursuant to the highway regulations in Title 23 of the United States Code.

Each state must develop regulations for evaluating noise impacts on noise sensitive receivers and for providing noise impact mitigation. UDOT has responded by publishing the UDOT Traffic Noise Abatement Policy 08 A2-1, revised March 8, 2004. The UDOT noise policy states:

> Noise abatement will be considered for Type I projects where noise impacts are identified. A Type I project is one that includes construction of a transportation facility on a new location, increases the number of through traffic lanes, or substantially alters the horizontal or vertical alignment of an existing facility.

UDOT's Noise Abatement Criteria are provided in Table 3.5. These criteria are consistent with Utah Code 72-6-111 and 112 and 23 CFR 772, described above.

Table 3.5: UDOT Noise Abatement Criteria

Activity Category	Hourly Equivalent Sound Level	Description of Activity Category
A	55 dB A-weighted decibel (db[A]) – exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	65 dB(A) – exterior	Picnic areas, fixed recreation areas, playgrounds, active grounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	70 dB(A) – exterior	Cemeteries, commercial areas, industrial areas, office buildings, and other developed lands, properties, or activities not included in Activity Categories A or B.
D	No limit	Undeveloped lands, including roadside facilities and dispersed recreation.
E	50 dB(A) – interior	Motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums. (The interior criterion only applies when there are no exterior activities to be affected by traffic noise.)

Source: UDOT 2004

Affected Environment

Because the project does not entail an improvement that would be classified as a Type I project, further classification of the project area's land uses and existing noise levels is not necessary.

Impacts

No-Build Alternative

No noise impacts are expected to result from the No-Build Alternative.

Build Alternative

Based on UDOT and FHWA policy, there are no areas where proposed improvements could be classified as Type I projects with the potential to increase noise. Although there will be some widening near the Boynton Overlook Wayside, found on Figure 2.1, these improvements would not substantially alter the horizontal or vertical alignment of the roadway and, therefore, do not qualify as Type I projects. No negative noise impacts are anticipated. However, by shifting the roadway away from the Calf Creek Recreation Area, it could potentially decrease noise from the road.

Temporary Construction Impacts

Short-term construction noise impacts are anticipated and would be caused primarily by the noise and vibration associated with construction activities. If Option 1—Rock Removal is selected for roadside stabilization at MP 75.4, the rock removal would require blasting operations. In addition to the noise impacts from standard construction methods and heavy machinery, the blasting would result in increased noise during construction. This noise could temporarily disturb wildlife populations. Option 2—Retaining Wall would only result in noise from standard construction methods and heavy machinery; no additional noise besides that caused by standard construction would result from the retaining wall option.

Mitigation

Noise impacts will be mitigated through the application of UDOT Standard Specification 01355 Environmental Protection, which outlines provisions for noise and vibration control and includes the following:

- Noise exceeding 95 dB(A) at sensitive noise receptor sites between 7 am and 9 pm is prohibited.
- Noise exceeding 55 dB(A) at sensitive noise receptor sites on Sundays and state holidays is prohibited.
- Standards for hours of construction and methods for blocking noise from construction activities adjacent to sensitive receptors set by Standard Specification 01355 will be followed.

3.7 GEOLOGY, SOILS, AND TOPOGRAPHY

Affected Environment

Topography

The project area ranges from 5,180 feet above mean sea level at Escalante River to 6,775 feet above mean sea level on the Hogsback just south of Boulder. It also has relatively steep roadway grades (up to 14 percent) in places. Near vertical slopes occur away from the edge of SR-12, both rising above the road in some locations and falling away from the road in others. A topographic map of the area is shown on Figure 3.7.

Bedrock

The alignment crosses four bedrock units: the Kayenta Formation, Navajo Sandstone, Page Sandstone, and Carmel Formation. The Kayenta Formation is composed of sandstone with interbeds of siltstone, mudstone, limestone, and conglomerate. The Kayenta Formation weathers to form a series of benches, ledgy slopes, and short cliffs. The Navajo Sandstone is composed of massive, well-cemented sandstone with prominent cross beds. The Navajo Sandstone erodes to form cliffs, ridges, rounded knobs, and hummocky mesas. The Page Sandstone consists of cross-

bedded, well-cemented sandstone with occasional interbeds of silt. The Page Sandstone often forms a resistant ledge that caps cliffs and mesas carved into the Navajo Sandstone. The Carmel Formation consists of interbedded shale and sandstone with lesser amounts of limestone and gypsum. The Carmel Formation generally erodes to form irregular slopes with minor ledges.

Soils

Soils along the alignment consist mainly of sands and sandy loams developed on the sandstone and shale bedrock. However, there is isolated sandy and silty alluvium developed on fans and in floodplains in the project area. These soils generally range from very well drained to excessively drained. Cryptobiotic crusts likely exist on many of the soils along the alignment. These crusts are formed by communities of cyanobacteria, mosses, and lichens. These crusts play an important role in protecting soils from erosion, promoting infiltration of rain and snowmelt, and facilitating germination of plants.

Other Geologic Features

There are no Quaternary faults near the alignment. While Harty's *Landscape Map of Utah* shows no landslides along the alignment, her mapping is very general and does not include many small-scale slides. Considering conditions along the alignment—such as local steep slopes, fractured bedrock, and drainages formed in shale and unconsolidated soils—there are likely local, small-scale landslides, including rock falls, topples, and debris flows.

Impacts

No-Build Alternative

There would be no impacts related to topography, geology, or soils from the No-Build Alternative. Localized erosion and rock falls would continue to occur both above and below SR-12, including in areas where the existing embankment is unstable and where existing concrete barriers are not adequately supported.

Build Alternative

Under the Build Alternative, localized erosion and rock falls would continue to occur both above and below SR-12. However, in several areas where the existing roadway and concrete barriers are not adequately supported, such as MP 74.8, 75.4, and 77.5 to 77.7, the roadway would be shifted away from unstable slopes, effectively increasing the safety and life of the facility. Impacts related to topography, geology, and soils resulting from the Build Alternative include removal of bedrock, possible increased risk of landslides in isolated areas, possible alteration of water runoff systems in isolated areas, and possible disturbance of cryptobiotic crusts. More detailed information about these impacts is described in the sections below.

Removal of Bedrock

The Build Alternative would call for the removal of bedrock at three locations—MP 71.0, MP 74.8, and MP 77.5 to 77.7—and the possible removal of bedrock at another location—MP 75.4. The bedrock in these locations consists of Kayenta Formation and Navajo Sandstone. These formations outcrop extensively throughout the region so localized removal would have minimal impact on the formation as a whole.

Landslide Risk

Though much of the bedrock along the alignment consists of well-cemented sandstone that is not susceptible to landslides, there are potential landslide hazards in isolated areas where the bedrock is composed of shale or highly fractured limestone. These hazards could be exacerbated

by steepening associated with the proposed road widening or shifting, which requires cutting into the existing terrain.

Soil Erosion and Cryptobiotic Crust

Construction and increased maintenance activities would impact soils and cryptobiotic crust in the immediate area of disturbance. Shale and gypsum bedrock as well as unconsolidated soils are susceptible to rapid erosion by running water. Any disturbances to water runoff systems that increase surface flow over these materials would likely result in increased erosion. Such disturbances could include the compaction of soils, which would decrease infiltration; the blockage of drainage channels; or the creation of new channels. Any disturbance of cryptobiotic crusts will increase erosion, decrease infiltration of groundwater, and impair the ability of plants to germinate.

Mitigation

Detailed slope stability analyses will be conducted prior to any actions that would increase the steepness of slopes. The resulting slopes will be designed to avoid new landslide hazards. An erosion prevention plan will be prepared prior to construction. This plan will include guidelines on minimizing soil compaction, maintaining existing drainage channels, minimizing erosion during construction, and capturing any soil eroded from disturbed areas. The plan will also include information on minimizing impacts to cryptobiotic crust, including limiting the area over which vehicles and heavy equipment are allowed to operate.

3.8 FLOODPLAINS

Regulatory Setting

Floodplains are normally dry areas adjacent to water bodies (e.g., rivers or lakes) that are subject to periodic flooding.

EO 11988 Floodplain Management directs federal agencies to reduce the risk of flood impacts on human safety, health, and welfare and to restore and preserve the natural and beneficial values served by floodplains. Proposed projects must avoid floodplains if possible and minimize unavoidable impacts. Floodplains are regulated by the Federal Emergency Management Agency (FEMA) through the National Flood Insurance Program (NFIP). The NFIP provides federally backed flood insurance for communities that enforce floodplain management ordinances to reduce future flood damage. Community participation in the NFIP is voluntary.

FEMA performs hydrologic and hydraulic studies to identify and delineate special flood hazard areas, which are areas that are subject to the 100-year flood. The 100-year flood has a one percent chance of being equaled or exceeded in any given year. FEMA publishes these floodplain delineations on official flood insurance rate maps (FIRMs). The FIRMs identify floodplain and floodway boundaries, base flood elevations, and insurance risk zones. Some areas do not yet have official FIRMs published. However, these areas may have flood hazard boundary maps (FHBMs). A FHBM is an official FEMA map that delineates the approximate boundary of the 100-year floodplain but does not identify insurance risk zones or flood elevations. A FHBM is generally the initial map provided to a community and is eventually superseded by a FIRM.

To the extent practicable, a proposed action should not significantly encroach on a floodplain. If a project encroaches on a FEMA-designated, 100-year floodplain, coordination with the local

floodplain coordinator is required during design. The local floodplain coordinator for the NFIP community will review the hydrologic and hydraulic calculation to verify there is no increase in water surface elevation. If this is the case, no further coordination is required.

Affected Environment

Escalante and unincorporated Garfield County both participate in the NFIP. However, there are some areas along the corridor that FEMA has not studied. These areas are considered "C" zones or areas where no special flood hazards have been identified. Figure 3.8—Sheet 1 shows FEMA map panel locations. Table 3.6 lists the status of FEMA floodplain mapping and summarizes the presence of floodplains along the corridor.

Table 3.6: FEMA Floodplain Mapping Status

Panel	MP	Latest FEMA Issued Flood Map	FEMA Designated Floodplains Along SR-12	Floodplain Impacts	EA Figure
Escalante City FIRM 490067 001B (August 28, 1979)	59.8 – 60.1	FIRM 490067 001B (August 28, 1979)	No floodplains adjacent to SR-12	No	Figure 3.8 (Sheet 2 of 5)
FIRM 490065 0750 B FHBM 490065 0030 A	60.1 – 73.0	FIRM 490065 0750 B (August 5, 1986)	No floodplains adjacent to SR-12	No	Figure 3.8 (Sheet 3 of 5)
FIRM 490065 0775 B FHBM 490065 0031 A	73.0 – 74.1 (Escalante River crossing)	FHBM 490065 0031 A *FIRM not available	Special flood hazard area present at Escalante River crossing	No	Figure 3.8 (Sheet 4 of 5)
FIRM 490065 0550 B FHBM 490065 0022A	74.1 – 79.4 (Calf Creek crossing and adjacent to road)	*FIRM not available *FHBM not available	No floodplain information available for Calf Creek crossing	Yes (non-FEMA designated floodplain impacts)	None
FIRM 490065 0525 B FHBM 490065 0021 A	79.4 – 82.1	FHBM 490065 0021 A (January 10, 1978) *FIRM not available	No floodplains adjacent to SR-12	No	Figure 3.8 (Sheet 5 of 5)
Boulder Town	82.1 – 86.3 (Boulder Creek crossing)	Not participating in NFIP *FIRM not available *FHBM not available	No floodplain information available for Boulder Creek crossing	No	None

**Not studied by FEMA*

The only FEMA designated floodplain adjacent to or intersecting SR-12 between Escalante and Boulder is at the Escalante River crossing. However, SR-12 also crosses two other major drainages—Calf Creek and Boulder Creek—but FEMA mapping is not available for these floodplains.

Impacts

No-Build Alternative

The No-Build Alternative would not result in new direct impacts to floodplains. There are no existing problems with floods overtopping SR-12.

Build Alternative

The Build Alternative would not result in impacts to FEMA designated floodplains. However, non-FEMA designated floodplains at Calf Creek could be impacted.

Build Alternative Impacts to Calf Creek Floodplain

Under the Build Alternative, there would be no net loss of floodplains, and floodplain elevation would not rise. Also, backwater would not rise by more than one foot or cause danger to life or property. Bridge replacement and stream realignment are proposed at the Calf Creek crossing. Although there are no FEMA designated floodplains at this location, there are wetland and riparian areas adjacent to the channel that are periodically inundated and function as a floodplain. Under the Build Alternative, the Calf Creek channel would be realigned. The new channel would be dredged through the existing floodplain, and the old channel would be filled in with material dredged for the new channel and graded to the existing floodplain elevation. The location of the channel and the floodplain would swap, and there would be no net loss of floodplains. The floodplain elevation would not rise. (See Section 3.11 for more details.)

During design, water surface elevations will be calculated and studied to ensure there is no danger to life or property resulting from bridge construction. Based on UDOT criteria, the crossing would be designed to accommodate a 50-year flow with two feet of clearance between the bottom of the structure and the water surface elevation. The crossing will be designed so that backwater (i.e., water backing up behind the structure during a flood event) will not increase by greater than one foot.

Temporary Construction Impacts

The Build Alternative could cause temporary impacts to the natural and beneficial value of floodplains. Natural and beneficial floodplain values include flood conveyance, storage and control, groundwater recharge, water quality function, and wildlife habitat and diversity. Disturbances from construction activities could temporarily impact water quality function and wildlife habitat and diversity.

Mitigation

During design, water surface elevations will be calculated and studied to ensure there is no danger to life or property resulting from bridge construction. Areas disturbed by realignment of Calf Creek and replacement of the bridge will be re-contoured to replicate the existing creek bed and floodplain elevations. The old channel will be filled in with a final grade elevation set at the existing floodplain elevation.

Short-term impacts to flood conveyance and storage as well as water quality will be minimized by allowing the existing channel to actively function until the new bridge and channel are completed.

3.9 WATER RESOURCES AND WATER QUALITY

Regulatory Setting

Rivers and streams are regulated by the U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act (CWA) and Section 10 of the Rivers and Harbors Act. In Utah, they are also regulated by the State Engineer's Office, Division of Water Rights.

Water quality is regulated under the CWA, and EPA has regulatory authority of the CWA. EPA delegates portions to the Utah Department of Environmental Quality, Division of Water Quality (DWQ) and Division of Drinking Water (DDW). Drinking water is regulated under the Safe Drinking Water Act.

The following regulations are applicable for the SR-12 project:

- CWA Section 404, Discharge of Dredged or Fill Material into U.S. Waters
- Utah Administrative Code (UAC) R655-13, Stream Alteration
- CWA Section 401, Water Quality Certification
- CWA Section 402, National Pollution and Discharge Elimination System (NPDES)
- UAC R317-8, Utah Pollutant Discharge Elimination System (UPDES)
- CWA Section 303(d), Impaired Waters
- UAC R317-2, Standards of Quality for Waters of the State
- Safe Drinking Water Act
- UAC R309-600, Drinking Water Source Protection for Groundwater Sources

CWA Section 404/Rivers and Harbors Act Section 10/UAC R655-13—Stream Alteration

Section 404 of the CWA regulates the discharge of dredged or fill material into "waters of the United States," including wetlands and streams. This program is jointly administered by the USACE and EPA. See Section 3.11 for more detail. Section 10 of the Rivers and Harbors Act requires authorization from USACE for the construction of any obstruction to the navigable capacity of waters of the United States. Any impact to a natural stream channel requires approval from USACE and the Utah Division of Water Rights. Depending on the level of impact, a joint permit may fulfill USACE requirements for Section 404, Section 10, and the Division of Water Rights. This joint General Permit 40 is commonly referred to as a Stream Alteration permit and is administered by Utah State.

A joint permit may not be possible for projects with larger impacts to stream channels or wetlands. If it is not possible, an individual or Nationwide 404 permit administered by USACE is required. The type of permit required depends on the impacts and is determined on a project-by-project basis.

CWA Section 401—Water Quality Certification

Section 401 of the CWA requires a water quality certification for any project that discharges into waters of the United States or for any project that involves a federal license or permit. In Utah, the 401 certification is incorporated into the 404 permitting process.

CWA Section 402 UPDES/UAC R317-8—Pollutant Discharge Elimination

Section 402 of the CWA is the NPDES. DWQ administers Section 402 under UAC R317-8, UPDES. A UPDES Storm Water General Permit for Construction Activities is required for any project disturbing more than one acre. This permit requires development of a stormwater pollution

prevention plan (SWPPP) to be implemented prior to construction. Dewatering activities, if necessary during construction, may require coverage under the UPDES General Permit for Construction Dewatering.

CWA Section 303(d)/UAC R-317-2—Water Quality Standards

Under the CWA, each state must establish water quality standards consisting of a narrative description of the designated uses (e.g., beneficial use classification) as well as the specific chemical and biological criteria necessary to protect these designated uses. All major water bodies in Utah State are assigned one or more beneficial use classification by DWQ. Beneficial use designations are based on the way in which the water is used. These uses include the following:

- Use as domestic water source
- Recreational use and aesthetics
- Use by aquatic wildlife
- Agricultural use

Section 303(d) of the CWA requires each state to monitor and assess surface waters and to compile a list of "impaired" waters that do not meet water quality standards for their designated beneficial use; this list is referred to as the 303(d) list. Once listed, DWQ must prepare a plan to restore water quality to meet standards for the beneficial use.

In addition to assigned use classes, DWQ also designates high quality waters. High quality waters have existing water quality that is better than established standards for the designated uses. Anti-Degradation Policy (R317-2-3) states that high quality waters must be maintained at high quality even if standards are exceeded. High Quality Waters—Category 1 has exceptional recreational or ecological significance. New point source discharges are prohibited to waters designated High Quality Water—Category 1. DWQ will consider new sources, such as roads, if pollution will only result during the actual construction activity and if best management practices (BMPs) will be employed to minimize pollution.

Safe Drinking Water Act/UAC R309-600—Drinking Water Source Protection

The quality of drinking water is regulated under the Federal Safe Drinking Water Act. The act was amended in 1996 to require all states to develop assessment programs that evaluate the risk of accidental contamination. In Utah, DDW administers the Drinking Water Source Protection (DWSP) program. Each public drinking water supplier must have a DWSP plan approved by DDW. This plan includes four source protection zones delineated for management purposes:

- Zone 1. Area within a 100-foot radius from the wellhead
- Zone 2. Area within a 250-day groundwater capture zone of the wellhead
- Zone 3. Area within a 3-year groundwater capture zone of the wellhead
- Zone 4. Area within a 15-year groundwater capture zone of the wellhead

Potential contamination sources (PCSs) are identified within each zone. A source PCS is defined as "any facility or site that employs an activity or procedure [that] may potentially contaminate groundwater" (Safe Drinking Water Act). The DWSP must also contain a management program to control each PCS and to control or prohibit future PCSs. Various activities could be restricted if they jeopardize the water quality of the source.

Affected Environment

Rivers and Streams

Major water resources crossing or adjacent to the corridor include the Escalante River, Calf Creek Boulder Creek, and Alvey Wash. The project is located entirely within the Colorado River West Watershed Management Unit. SR-12 traverses three smaller watersheds and six sub-watersheds between Escalante and Boulder. Watershed boundaries and surface waters are shown on Figure 3.9.

The Escalante River begins at the confluence of North and Birch Creeks near Escalante City. It then flows southeast to the Colorado River at Lake Powell. The Escalante crosses under SR-12 near MP 73.8 at the mouth of Calf Creek Canyon. The Escalante Canyons region of the Grand Staircase-Escalante National Monument is classified as semi-arid, and the majority of the Escalante's base flow is supplied by several tributaries—Pine, Mamie, Calf, Boulder, and Deer Creeks.

Calf Creek is approximately nine miles long and is located entirely within the monument. The base flow for Calf Creek is derived exclusively from Navajo Sandstone spring discharge. Calf Creek flows south down Calf Creek Canyon and adjacent to SR-12 to the confluence with the Escalante River. Calf Creek crosses under SR-12 from the west side of the road to the east at MP 74.5. It is managed as a primitive recreational area with minimal human disturbance. For more information on Calf Creek, see Sections 3.8, 3.10, 3.11, and 3.12.

Boulder Creek begins with the headwaters on Boulder Mountain and flows south for 30 miles to the confluence with Deer Creek and the Escalante River. Near the town of Boulder, Boulder Creek crosses under SR-12 in a concrete box culvert. Downstream from Boulder, Boulder Creek runs south, parallel to SR-12 on the east side of the Hogsback. The west side of the Hogsback is formed by Calf Creek.

Alvey Wash begins high in the Kaiparowits Plateau as a broad, sandy wash. It runs south of and parallel to SR-12 across the Big Flat. It crosses Hole-in-the-Rock Road at MP 4 where its name changes to Harris Wash. Harris Wash enters the Escalante River 20 miles downstream in a deeply incised canyon.

Water Quality

The beneficial use and assessment of the surface waters completed by DWQ for Section 303(d) of the CWA are shown in Table 3.7. The quality of water is assessed as "fully supporting" (i.e., good to excellent water quality), "partially supporting" (i.e., meets the standards most of the time), and "not supporting" (i.e., frequently the water quality standards are not met).

Table 3.7: DWQ Beneficial Use Assessment

Water Body	Beneficial Class Use	Assessment	Pollutant	Comment
Escalante River from confluence with Boulder Creek to headwaters	2B, 3A, 4	Fully supporting Class 4, partially supporting Class 3A, insufficient data to assess Class 2B	Class 3A partially supporting for temperature	DWQ has requested change in beneficial use class from 3A to 3B.

Water Body	Beneficial Class Use	Assessment	Pollutant	Comment
Calf Creek from confluence with Escalante River to headwaters	2B, 3A, 4	Fully supporting Classes 3A and 4; insufficient data to assess Class 2B	N/A	N/A
Boulder Creek from confluence with Escalante River to headwaters	2B, 3A, 4	Fully supporting Classes 3A and 4; insufficient data to assess Class 2B	N/A	N/A
Lower Alvey Wash and tributaries	2B, 3C, 4	Insufficient data to assess	N/A	N/A

Beneficial Class Use Definitions:

- *2B: Protected for secondary contact recreation such as boating, wading, or similar uses.*
- *3A: Protected for cold water species of game fish and other cold water aquatic life, including the necessary aquatic organisms in their food chain.*
- *3C: Protected for nongame fish and other aquatic life, including the necessary aquatic organisms in their food chain.*
- *4: Protected for agricultural uses, including irrigation of crops and stock watering.*

Source: DWQ 2006(b)

Calf Creek, Boulder Creek, and Alvey Wash are not impaired for water quality. The Escalante River is listed as impaired because it cannot support cold water species due to its temperature. However, DWQ does not believe this impairment is appropriate and is currently in the process of appealing the beneficial use designation.

DWQ has completed a water quality management plan for the Escalante River Watershed. In 2002, the upper Escalante River was listed on the 303(d) list of impaired waters due to higher temperatures than allowed for beneficial use category 3A (i.e., cannot support cold water species of game fish and other aquatic life). The tributaries of the Escalante were not listed as impaired.

Investigations for the water quality management plan found naturally high temperatures in the Escalante River and its tributaries. Water quality standards for the 3A temperature classification were exceeded 70 percent of the time. DWQ is in the process of requesting a change in beneficial use designation from 3A, cold-water fishery, to 3B, warm-water.

Calf Creek and its tributaries, from its confluence with the Escalante River to its headwaters, are designated a High Quality Water—Category 1. This designation, as previously discussed, requires that Calf Creek's water quality be maintained.

Stormwater Runoff

The existing drainage system is typical for a rural highway. Precipitation falls on the roadway and runs off the edge of asphalt as sheet flow. Sheet flow is very shallow, slow-velocity overland flow and is not channelized. There is no curb and gutter to concentrate flow for most of the corridor. In fill sections, the sheet flow infiltrates or runs down the embankment. In some areas prone to erosion, UDOT maintenance crews have created an asphalt lip at the edge of the pavement to keep sheet flow from eroding the embankment. The lip directs flow to areas less susceptible to erosion. To avoid concentrating flow, these sections are kept as short as possible. In cut sections, the sheet flow runs into a ditch parallel to the road. Roadside ditches are carried across the road by periodic cross culverts.

Because flow is not concentrated, there are no detention basins or structural water quality treatment measures, such as oil water separators, on the corridor. DWQ generally prefers to keep runoff dispersed; dispersed flow can infiltrate into the ground and release pollutants as water flows overland through vegetation. Concentrated flow results in more water quality concerns; higher velocities lead to increased erosion and less opportunity for pollutant removal prior to discharging into a water body.

Groundwater

The main groundwater aquifer in the project area lies within the Jurassic Navajo Sandstone. Recharge to the aquifer occurs in the high elevations of Boulder Mountain, and discharge occurs in springs that feed the perennial tributaries of the Escalante River. The Navajo Sandstone aquifer system provides large quantities of high quality groundwater.

The Jurassic Navajo Sandstone aquifer is part of the Glen Canyon Aquifer system. This regional aquifer system encompasses parts of Colorado, Arizona, and Utah. The Glen Canyon Aquifer system is divided into three formations: Wingate Sandstone at the base, Kayenta Formation in the middle, and Navajo Sandstone on top. Groundwater flow in the Glen Canyon Aquifer is toward major discharge areas, including the Colorado River.

EPA has designated portions of the Glen Canyon Aquifer as a sole or principal source of drinking water for Moab, Utah. However, the designated area, including Moab and immediately adjacent recharge areas, is entirely within Grand County. The SR-12, Escalante to Boulder, project is entirely within Garfield County and does not threaten the sole source aquifer system near Moab.

Public Drinking Water Sources

DDW regulates all public drinking water sources, including wells, springs, and surface water sources. As shown on Figure 3.10, there are three planned or existing public drinking water sources in the vicinity of SR-12 between Escalante and Boulder: one spring and two wells. There are no surface water sources used for drinking water in the project area. Information from the DDW database for these sources is shown in Table 3.8.

Table 3.8: DDW Water Sources Along SR-12 Corridor

Drinking Water Source	Type	Status	Protection Zone Overlapping SR-12
East Side Water Company—Planned Well (MP 62)	Planned well community system	Inactive	Zones 3 and 4
Calf Creek Spring (Calf Creek Recreation Area)	Transient non-community spring	Active	Optional two-mile radius delineation for wellhead protection area (Zones 2, 3, and 4)
Boulder Mountain Lodge (MP 83.5)	Transient non-community well	Active	Zone 4

Transient non-community water systems are defined by DDW as sources that serve less than 25 of the same nonresident persons per day for more than six months of the year. Examples include recreational vehicle (RV) parks, diners, or convenience stores where the permanent nonresident staff number is less than 25 but the number of people served exceeds 25. Drinking water source protection plans are not required for transient systems. There is not a plan available for the Boulder Mountain Lodge.

According to the DDW database, the East Side Water Company well is inactive. However, there is a preliminary evaluation report on file with DDW. The East Side Water Company plans to drill

and develop a well for use as a public water system designed for 20 to 30 residential home hook-ups. Residents would use the water year-round, classifying the well as a community water system. SR-12 is listed as a potential contamination source, crossing through Zones 3 and 4. The potential hazards include spills from hazardous materials being transported on SR-12 as well as salt and other de-icing agents.

Drinking water source protection plans are not required for transient systems; however, a plan exists for the Calf Creek Spring. The source water protection zones for this spring were delineated using an optional two-mile delineation procedure. This procedure is allowed by DDW and is best applied in remote areas where there are few, if any, potential contamination sources. This method results in circular protection zones with a two-mile radius and is not based on hydrogeologic analysis. The spring is above Calf Creek on the east side; it is not influenced by the stream. Because of this, the areas within two miles of the spring on the west side of Calf Creek are not included in the source water protection zones, as shown on Figure 3.10. SR-12 is listed as a potential contamination source with low susceptibility. Spills and volatile organic compounds (VOCs) are listed as potential hazards.

In 2006, a spring inventory was completed to provide information on the groundwater source and the behavior of groundwater in the area around tributaries at Escalante River's headwaters. Results indicate the recharge area for this spring on New Home Bench.

Groundwater Wells

Groundwater wells are inventoried by the Utah Division of Water Rights. Groundwater wells are used for public drinking water (as discussed above), private domestic use (e.g., drinking water in a private home or business), irrigation, and other purposes. Figure 3.10 shows wells in the Utah Division of Water Rights database within two miles of the corridor. Within this distance, there are 189 wells with existing groundwater rights. These wells are classified according to use.

Table 3.9: Wells Within Groundwater Study Area

Use	Number of Wells
Domestic*	142
Irrigation	159
Other	124
Stock Watering	12
**Domestic use indicates that the well supplies drinking water to private homes or businesses.*	
Note: Most wells serve multiple uses. Individual wells may be listed for multiple uses.	

Impacts

No-Build Alternative

The No-Build Alternative would not result in new direct impacts to rivers and streams, groundwater, public drinking water sources, groundwater wells, or stormwater runoff. However, surface water quality may degrade due to several things:

- Difficulty maintaining roadway culverts and cut ditches because of unclear or inadequate right-of-way. Inadequately maintained drainage features could result in unanticipated erosion and sediment loading to surface waters.
- Scour that would continue to erode the stream bank and the abutment of the Calf Creek Bridge. Scoured sediment would continue to be deposited downstream, impacting the water quality of Calf Creek.

- Hazardous materials deposited into Calf Creek as the result of a collision. Existing bridge parapets at Calf Creek do not meet crash test requirements so, in the event of a collision, vehicles could end up in Calf Creek, releasing hazardous materials and impacting surface water quality.
- An unstable roadway embankment at MP 74.8. Over time, potential for embankment failure would increase. Embankment failure would result in a substantial amount of sediment and debris entering Calf Creek.

Build Alternative

The Build Alternative would not result in new impacts to the Escalante River, Alvey Wash, or Boulder Creek. The Build Alternative would result in a long-term decrease of scour and sediment loading into Calf Creek and would decrease the likelihood of road debris entering Calf Creek. Runoff would increase slightly due to an increase in impervious area, discussed in further detail below; however, the impact to surface waters would be negligible. The proposed spot improvements are far enough away from these features that the increased runoff would be imperceptible and existing drainage patterns would remain. Water quality would continue to be addressed through dispersed overland flow. Runoff would continue to have an opportunity to infiltrate into the ground before reaching the rivers and streams. Retaining the existing flow patterns and avoiding concentration of stormwater is in accordance with recommendations from DWQ, as stated in the correspondence dated February 27, 2007 available in Appendix A.

Impacts to specific water resources are discussed in detail below.

Rivers and Streams

The Build Alternative would not result in new impacts to the Escalante River, Alvey Wash, or Boulder Creek. Two improvements included in the Build Alternative would result in impacts to Calf Creek: 1) the replacement of Calf Creek Bridge, and 2) the roadway stabilization at MP 74.8. Impacts and mitigation resulting from the replacement of Calf Creek Bridge are also discussed in Sections 3.8, 3.10, 3.11, and 3.12.

Replacement of Calf Creek Bridge would result in the realignment of approximately 300-linear feet of Calf Creek. The old channel would be filled in with material dredged from the new channel; it would function as a floodplain and would likely convert to wetland over time. Scour and sediment loading would decrease, thereby improving water quality.

The new box culvert would be approximately 55-feet long, which is twice as long as the existing structure. Roadway widening for the new bridge and roadway approaches would result in a slight increase in runoff to Calf Creek, approximately 0.1 cubic feet per second (cfs). New bridge parapets would be designed to meet crash test requirements. In the event of an accident, vehicles would be redirected onto the road rather than into Calf Creek, decreasing the risk of hazardous materials entering into the creek.

Roadway stabilization at MP 74.8 would also result in impacts to Calf Creek. Calf Creek is below SR-12 on the west side of the road at this location, and the embankment is almost vertical. Shifting the roadway to the east, away from Calf Creek, could result in positive impacts to Calf Creek. Debris from the road could be less likely to reach Calf Creek. The proposed ditch on the east side of the road could provide a better opportunity to contain an accidental spill on the roadway.

Groundwater

The Build Alternative would not result in permanent impacts to groundwater resources, private groundwater wells, or water rights. Although the impervious area would increase slightly, impacts to groundwater recharge would be insignificant. Runoff would continue to sheet flow off of the roadway and would be allowed to infiltrate into the ground.

Potential impacts resulting from construction activities are expected to be limited. Excavation required during construction of the Calf Creek Bridge and realignment of the Calf Creek channel may require temporary dewatering of shallow groundwater. However, the water would be allowed to recharge nearby. Groundwater quality could potentially be impacted by construction equipment leaking fuel or by accidental spills. Potential impacts to groundwater quality from construction activities will be mitigated through requirements of UDOT Standard Specification 01355 Environmental Protection.

Public Drinking Water Sources

The Build Alternative would not result in impacts to any public drinking water sources. No improvements are proposed within the source water protection zones for either the planned East Side Water Company well or the Boulder Mountain Lodge well.

There are several proposed improvements for the Calf Creek spring within source water protection Zones 2 to 4. However, as discussed above, the recharge area for this spring is likely on New Home Bench. Proposed improvements on New Home Bench (two slow-vehicle turnouts) are approximately four miles from the Calf Creek spring. Groundwater is filtered naturally as it moves through the sandstone. Impacts to water quality from these proposed improvements would be negligible.

Stormwater Runoff

As shown in Table 3.10, the Build Alternative would result in a slight increase in impervious area (e.g., pavement) and storm runoff. Increase in runoff for each spot improvement was calculated for a ten-year storm event. A ten-year storm event is defined as the largest storm that is probable to occur within a ten-year period. A ten-minute time of concentration was assumed.

Table 3.10: Stormwater Runoff

Proposed Improvement	Increase in Impervious Area (Acres)	Increase in 10-Year Storm Runoff (cfs)	Receiving Water
Obtain right-of-way	0	0	N/A
Replace Calf Creek Bridge	0.08	0.1	Calf Creek
Stabilize roadway at MP 74.8	0.08	0.06	Calf Creek
Stabilize roadway at MP 75.4	0.05	0.04	Overland flow to Calf Creek (300 feet)
Stabilize roadway at MP 77.5 – 77.7	0.18	0.14	Overland flow to Calf Creek (600 feet)
Turnout at MP 69.9	0.21	0.27	Overland flow to dry wash and then to Escalante River (5 miles)

Proposed Improvement	Increase in Impervious Area (Acres)	Increase in 10-Year Storm Runoff (cfs)	Receiving Water
Turnout at MP 71.7	0.29	0.37	Overland flow to dry wash and then to Escalante River (5 miles)
Turnout at MP 72.5	0.26	0.33	Overland flow to dry wash and then to Escalante River (2 miles)
Turnout at MP 76.2	0.17	0.21	Overland flow to dry wash and then to Calf Creek (0.5 miles)
Turnout at MP 79.5	0.26	0.33	Overland flow to dry wash and then to Boulder Creek (2.5 miles)
Turnout at MP 83.0	0.25	0.32	Overland flow to dry wash and then to Boulder Creek (6 miles)
Improve intersection at Hole-in-the-Rock Road	0.9	1.15	Dry wash to Alvey Wash (1.5 miles)
Improve intersection at Calf Creek Recreation Area	0.53	0.68	Overland flow to Calf Creek (200 feet)
Widen narrow curve at MP 71.0	0.03	0.04	Overland flow to dry wash and then to Escalante River (5 miles)
TOTAL	**3.29**	**4.04**	

Flooding is not a concern with the existing drainage system. The increase in runoff is not large enough to warrant the construction of detention or retention basins that would capture additional flow. Existing drainage patterns would remain, and the Build Alternative would not result in new concentrated discharges, which could cause erosion.

Temporary Construction Impacts

Construction activities—such as grading, heavy equipment traffic, stockpile, and material staging—disturb vegetation and cause erosion. Runoff from disturbed areas could increase suspended sediment loading into receiving waters. Construction activities near Calf Creek could result in temporary impacts to Calf Creek. Blasting operations could result in debris entering Calf Creek, and runoff from disturbed areas could result in increased suspended sediment loading. Heavy equipment could leak fluids and result in hydrocarbons entering the creek.

Mitigation

Mitigation for impacts resulting from the replacement of Calf Creek Bridge and the realignment of Calf Creek will be addressed through requirements of the USACE 404 permit or the Division of Water Rights Stream Alteration permit; the DWQ UPDES permits; and the use of BMPs. Calf Creek Bridge will be replaced with a box culvert or an open-bottomed bridge. If the box culvert option is chosen, its bottom would be placed at an elevation that would retain natural stream substrates and maintain natural conditions. The new channel will be contoured to match existing stream bed elevations and cross section elements. Final design will evaluate erosion protection

measures for the new channel bed and banks. Prior to constructing the new channel, wetland topsoil will be stripped from the areas to be disturbed and will be stockpiled. The old channel will be filled in with material dredged for the new channel. The final grade elevation will be set at the wet meadow elevation. Disturbed areas in or adjacent to wet meadows will be spread with the stockpiled wetland topsoil. Other disturbed areas will be revegetated with a native seed mix. If possible, drainage design will route roadway runoff overland before discharging to the creek.

BMPs specific to bridge replacement will include the following:

- Where possible, materials and equipment will be staged away from stream banks and located in areas that minimize impacts to existing vegetation.
- Existing vegetation will be protected by preventing disturbance beyond specified construction limits.
- Creek access points will be limited to those necessary for construction.
- Fuel and other hazardous materials will be stored and handled as far away from the creek as is possible.
- Construction equipment will not be cleaned in the stream channel.
- Silt fence and fiber rolls will be installed where appropriate to keep sediment laden runoff from entering the creek.
- Demolition of the existing bridge will be done in a manner that minimizes impacts to the channel. Every effort will be made to prevent demolition debris from entering the channel.
- The contractor will submit a spill prevention, containment, and counter measure plan (SPCCP), including an inspection program for equipment operating near surface water, refueling and maintenance procedures, parking locations for equipment, and preparations for a quick response to accidental spills of petroleum or hazardous substances. Also, potential fish spawning areas will be protected.

Mitigation for increased erosion and sedimentation will be addressed through UPDES permit requirements and through the use of BMPs. An erosion control plan and SWPPP will be developed and incorporated into construction documents. Disturbed areas will be revegetated with a native seed mix. BMPs for erosion will include the following:

- Existing vegetation will be protected by preventing disturbance beyond specified construction limits.
- Silt fence and fiber rolls will be installed where appropriate to keep sediment laden runoff from leaving the construction site.
- Disturbed slopes will be stabilized and revegetated in accordance with UDOT Standard Specifications 02912 Topsoil and 02922 Seed, Turf Seed, and Turf Sod.
- Runoff will be diverted away from exposed soil.
- The contractor will notify DWQ if turbidity in adjacent surface water is increased by ten nephelometric turbidity units (NTUs) or if there is any visible increase in turbidity as a direct result of the project.

Mitigation for impacts resulting from roadway widening or stabilization will be addressed through requirements of the DWQ UPDES permit and the use of BMPs. BMPs specific to

roadway stabilization by blasting will include the following:

- Precautions will be taken to keep debris from entering Calf Creek.
- Heavy equipment will be staged as far away from the creek as possible.
- Debris cleared from the road will not be pushed toward the creek.
- No fill material that could leach organic chemicals (e.g., discarded asphalt) or nutrients (e.g., phosphate rock) into the receiving water will be used.

Required Permits

Mitigation for impacts to water resources is generally addressed through required permits and approvals. Table 3.11 provides a summary of the permits and approvals related to water resources and water quality that will be obtained prior to construction.

Table 3.11: Required Permits and Approvals

Agency	Permit/Approval Required	Status
USACE	Section 404 Permit	USACE has concurred with wetland delineation and identification of waters of the U.S.; the correspondence can be found in Appendix A. A Section 404 Permit will be required for replacement of Calf Creek Bridge. Because the permanent impact to jurisdictional waters is less than 0.5 acres, a Nationwide 404 permit may be possible for this project. Requires coordination during design phase with USACE and Utah Division of Water Rights to determine appropriate permit for Calf Creek Bridge replacement and realignment of Calf Creek.
Division of Water Rights	Stream Alteration Permit	Requires coordination during design phase with USACE and Utah Division of Water Rights to determine appropriate permit for Calf Creek Bridge replacement and realignment of Calf Creek.
DWQ	Section 402 UPDES Stormwater General Permit for Construction Activities	Development of a SWPPP and temporary erosion control plan required during design phase. Filing of notice of intent (NOI) required prior to construction. Filing of notice of termination (NOT) is required when construction is completed.
DWQ	Section 402 UPDES General Permit for Construction Dewatering	May be required (if there are any dewatering activities during construction).

3.10 WILD AND SCENIC RIVERS

Regulatory Setting

The National Wild and Scenic Rivers System (NWSRS) was created by the Wild and Scenic Rivers Act of 1968. This act is the primary federal regulation governing the treatment of rivers that possess remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values. Stream segments that have been classified as "wild," "scenic," or "recreational," and are therefore deemed suitable for designation into the NWSRS by an agency, must be protected to maintain their suitability status, even if that designation has not yet been approved by Congress. Each suitable segment is protected within a management corridor—approximately a quarter mile on each bank.

Affected Environment

Although no rivers in Utah have been designated by Congress into the NWSRS to date, two rivers within the project limits have been designated by the BLM as suitable and have been recommended for inclusion into the NWSRS. These two suitable rivers located within the project area are the Escalante River and Calf Creek. Along with other suitable rivers in the monument, the locations of these two protected rivers and their relationship to the SR-12 corridor are shown on Figure 3.11.

Impacts

No-Build Alternative

No designated or candidate wild and scenic rivers would be directly impacted by the No-Build Alternative. However, continued deterioration would result in indirect impacts to surface water quality, as discussed in Section 3.9.

Build Alternative

SR-12 crosses the Escalante River at the boundary between Segment 1, classified by BLM as wild, and Segment 2, classified as recreational. Segment 1 flows from the confluence of Pine Creek to SR-12. Segment 2 flows from SR-12 to the east side of a private land parcel. The Build Alternative would not impact either segment of the Escalante River because no changes or construction are proposed for this portion of the roadway.

The Build Alternative would impact a small section of Calf Creek, Segment 3, classified by BLM as recreational. Segment 3 is the portion of Calf Creek that runs adjacent to SR-12 before it flows into the Escalante River. The Build Alternative includes improvements to the Calf Creek Bridge on SR-12 due to its current structural condition. Current problems related to channel erosion and scour at the southwest abutment will be mitigated. By turning the creek east at a more gradual angle, scouring forces and erosion would be reduced, and the creek would cross SR-12 at a new location that is north of its current location. Approximately 300 feet of the Calf Creek channel would therefore be realigned, which involves filling in about 140 feet of the river on either side of SR-12 and excavating a new channel for Calf Creek to follow as it crosses the SR-12 right-of-way. The 23-foot long box culvert that currently carries Calf Creek under SR-12 would be replaced with a 55-foot long box culvert to accommodate the new roadway width and skew angle.

Mitigation

Work performed to realign Calf Creek will be conducted to preserve the qualities that led to its recreational classification and recommendation for inclusion in the NWSRS. To be classified as recreational, a river segment must offer "recreation-related opportunities [that] could include—but not be limited to—sightseeing, wildlife observation, camping, photography, hiking, fishing, hunting, and boating" (BLM 1993). Therefore, realignment plans and activities will be designed to re-create the existing natural character, wildlife habitat, and hiking/fishing access afforded by the existing segment. BLM, U.S. Fish and Wildlife Services (USFWS), and USACE will be coordinated with during design to develop criteria for re-creating this recreational resource.

To re-establish the existing, undeveloped character of the river bank, the "recreation characteristics" that support this river segment's suitability determination will be re-established as quickly as possible. This re-establishment will be done by revegetating the disturbed area with native species and by restricting access to the area through signage for the two to three year revegetation period.

Mitigation measures for impacts to Calf Creek are discussed in Sections 3.9, 3.11, and 3.12.

3.11 WETLANDS/WATERS OF THE U.S.

Regulatory Setting, Studies, and Coordination

Waters of the U.S. or jurisdictional waters can include perennial and intermittent streams, wetlands, ephemeral washes, and vernal pools, among other features. Perennial and intermittent streams are discussed in Section 3.9 and include four major water features: Escalante River, Calf Creek, Boulder Creek, and Alvey Wash. One of these features, Calf Creek, would be impacted by the Build Alternative and falls within the jurisdictional delineation study area. The other three major water features would not be impacted by the Build Alternative. Therefore, Calf Creek is the only perennial stream discussed in this section. This section also describes the remaining jurisdictional waters—wetlands, ephemeral washes, and vernal pools. Regulations regarding these jurisdictional waters, the studies and coordination used to identify jurisdictional features, and the potential impacts and mitigation measures of alternatives are discussed as well.

Generally, wetlands are areas where the ground is saturated enough to influence soil and vegetative development. Wetlands can provide beneficial services, including protecting and improving water quality, providing fish and wildlife habitat, storing floodwaters, and maintaining surface flow during dry periods. The 1987 *USACE Wetland Delineation Manual* outlines three criteria that must be present in a jurisdictional wetland: hydrophytic vegetation, hydric soils, and wetland hydrology.

An ephemeral wash is a normally dry channel that carries water only in direct response to precipitation. Ephemeral washes are identified by a natural scour line on the bank, sand deposits in the channel bottom, and interrupted upland vegetation.

A vernal pool is a depression without an outlet. Vernal pools may contain water in the winter or spring but be completely dry for most of the summer and fall.

EO 11990 Protection of Wetlands directs federal agencies to minimize wetland loss and to preserve and enhance the natural and beneficial values of wetlands. Federally funded projects must avoid wetlands if possible and minimize unavoidable impacts. Section 404 authorizes the USACE to regulate activities within waters of the U.S. A Section 404 permit is required for any project that results in the discharge of dredged or fill material into jurisdictional waters. The Section 404 permit program is run by USACE with oversight by EPA.

A wetland delineation report, *U.S. Army Corps of Engineers Wetland Delineation Report on Proposed SR-12 Roadway Improvement Project Located Between Escalante and Boulder, Garfield County, Utah,* was prepared by Alpine Environmental Resources in March 2007. Wetlands and other jurisdictional waters were delineated within the study area. The study area includes sections of the SR-12 corridor that could potentially be impacted by the project, as shown on Figure 3.12. The delineation was completed in compliance with the 1987 *USACE Wetland Delineation Manual*. Field work was completed in November 2006. The *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* went into effect in March 2007. USACE directed Alpine Environmental Resources to complete the delineation in accordance with the 1987 *USACE Wetland Delineation Manual* only. Figure 3.12 shows the location of delineated features, including

Calf Creek and the wet meadow wetlands and riparian waters associated with Calf Creek as well as nineteen ephemeral washes and one vernal pool. These water features show surface water connection to the Escalante River—a traditionally navigable water way. The Escalante River is tributary to Lake Powell—a popular recreation destination that hosts visitors from around the world.

Alpine Environmental's wetland delineation report was submitted prior to jurisdictional guidance resulting from the Supreme Court decision in the consolidated cases Rapanos *v*. U.S. and Carabell *v*. U.S., collectively known as the "Rapanos" decision. UDOT was given the option to comply with either the pre-Rapanos guidance or the post-Rapanos guidance. For this project, the difference between the two is that some of the ephemeral washes that are jurisdictional under pre-Rapanos guidance are not jurisdictional under post-Rapanos guidance. In an effort to expedite the jurisdictional determination, UDOT opted to comply with the pre-Rapanos guidance.

Affected Environment

Alpine Environmental's wetland delineation report delineated 1.89 acres of jurisdictional waters within the study area, including 1.16 acres of wet meadow, 0.14 acres of vernal pool, 0.09 acres of perennial stream, and 0.50 acre of dry or ephemeral washes. USACE concurred with the delineation. The jurisdictional determination letter is available in Appendix A. Table 3.12 summarizes the jurisdictional features. The function and values of these water features is briefly described in Section 3.9.

Table 3.12: Jurisdictional Features

Feature	MP	Area*	Wetland Description
Ephemeral Dry Washes			
1	62.3	0.04	Ephemeral Dry Washes 1 through 13 flow to Alvey Wash, which flows to Harris Wash and then to the Escalante River. Ephemeral Dry Washes 14A and 14B flow into Phipps Wash, which flows into the Escalante River. Natural scour lines and sand deposits are evident in channel bottom. Vegetation is absent in channel.
2	62.7	0.03	
3	62.8	0.07	
4	63.4	0.02	
5	63.6	0.02	
6	63.7	0.03	
7	63.9	0.03	
8	64.0	0.02	
9	64.1	0.01	
10	64.3	0.02	
11	64.4	0.02	
12	64.5	0.03	
13	64.6	0.04	
14A	71.9	0.01	
14B	72.3	0.02	
Calf Creek A	74.4	<0.01	Ephemeral dry wash with fine red sand in channel bottom. Eroded gully adjacent to shelf with steep sides. Headwater to Calf Creek.
Calf Creek B	74.4	0.04	Steep ephemeral dry wash with one-quarter to one inch rocks in channel bottom. Headwater to Calf Creek.
15	75.1	0.03	Sandstone alcove in cliffs with fine sand and boulders in the bottom. Source or runoff is approximately one-quarter square mile area on Haymaker Bench. Alcove drains through culvert under roadway into Calf Creek approximately 1000 ft. west.
16	75.8	0.01	Sand deposits in bottom of channel. Interrupted upland vegetation. Source or runoff is approximately one-quarter square mile area on Haymaker Bench. Flows to Calf Creek.
Ephemeral Dry Wash Total:		**0.50**	Total acres of ephemeral dry wash in study area.

Feature	MP	Area*	Wetland Description
Perennial Stream			
Calf Creek	74.5	0.09	Perennial creek that floods frequently. Flows to Escalante River approximately 2000 ft. downstream. Vegetation is composed mainly of tamarisk with native willow and cottonwood growing on the bank.
Wetland			
Wet Meadow	74.5 – 74.6	1.16	Wet meadow wetland directly abutting Calf Creek. Evidence of hydrophytic vegetation and saturated, sandy hydric soils with distinct redox features. Vertical streaking indicates vertical movement of organic matter. Water table is close to the surface. Vegetation is composed largely of tamarisk stands with native willow and cottonwood also growing along the river bank. These areas are also vegetated with sedges, rushes, and a variety of grasses and forbs.
Vernal Pool			
Vernal Pool	70.9	0.14	Vernal pool with fine white sand collected in bottom. Channel adjacent to shelf with steep sides, flows into Phipps Wash. Channel is marked by an interruption of upland vegetation.
Total			
	***Area:**	**1.89**	
**Area measured inside of study area*			

All of these water features have a relatively high value because they are in a remote area that has not been disturbed by development or urbanization; however, they have been previously disturbed by the construction of SR-12.

Ephemeral Dry Washes

The dry washes found within the project area serve as headwaters to larger streams, which eventually make their way to the Escalante River. As storm runoff flows down these washes, a scour line marking the flow depth is created on the banks of the wash. The bottoms of the dry washes are generally coarse sand with little or no vegetation. These washes are marked by an interruption in upland vegetation, such as pinion, juniper, rabbitbrush, Russian thistle, mountain sage, snake weed, salt bush, and ephedra.

The primary function of ephemeral dry washes is to transport floodwater to larger streams. Braided channels and natural depressions in dry washes can retain surface water after a rainstorm. These small ponds and secondary channels dry up between storm events; however, they play a significant function for the local wildlife populations because they are the only water sources between storms. Evidence of rabbit and mule deer was found in some of these washes.

Perennial Stream—Calf Creek

Calf Creek is fed by springs and flows to the Escalante River. Calf Creek has a high recreational value through the Calf Creek Recreation Area and canyon. Pools and waterfalls offer popular destinations for hikers and photographers. The area is well-known for trout fishing. No threatened, endangered, or candidate species are known to occur in Calf Creek or Escalante River. Calf Creek is also discussed in Sections 3.8, 3.9, and 3.10.

Wetland—Wet Meadow

For most of the year, wet meadows are without standing water, though the high water table allows the soil to remain saturated. Wet meadows can help prevent flooding by temporarily storing water, allowing it to soak into the ground or evaporate. Water quality is also improved by removing excess nutrients from surface waters as they are absorbed or broken down by plants, animals, and chemical processes within the wetland. Wet meadows act as a natural filter. The nutrient rich environment provides vital food and habitat for many insects, amphibians, reptiles, birds, and mammals.

Vernal Pool

Vernal pools do not support breeding fish populations due to periodic drying. Many organisms have evolved to use vernal pools because they are not eaten by fish there. In the monument, vernal pools are a breeding habitat for the canyon tree frog, red spotted toad, and the tiger salamander among other species of amphibians.

Sediment drops to the bottom of these pools, leaving a relatively clean water source. These pools are important for local wildlife as they are often the only water source for many miles in the desert.

Impacts

No-Build Alternative

The No-Build Alternative would not result in new direct impacts to jurisdictional features, which include perennial streams, wetlands, ephemeral washes, or vernal pools. However, this would mean that existing problems at Calf Creek would not be addressed. These problems are discussed in Section 3.9.

Build Alternative

The Build Alternative would result in 0.18 acres of permanent impacts and 0.38 acres of temporary impacts to jurisdictional features. Permanent impacts include 0.02 acres of ephemeral dry wash, 0.06 acres of perennial stream, and 0.10 acres of wet meadow. Temporary impacts include 0.03 acres of ephemeral dry wash and 0.35 acres of wet meadow. Impacts have been calculated by overlaying the footprint of the proposed improvements on the delineated jurisdictional features and measuring the overlapping area using MicroStation software. Temporary impacts have been calculated assuming a 20-foot construction disturbance zone outside the roadway footprint. Calculated impacts are summarized in Table 3.13.

Table 3.13: Impacts to Jurisdictional Features

Feature	MP	Linear Impact (FT)	Acres within Project Study Area	Permanent Impact Area	Temporary Impact Area
Ephemeral Dry Washes					
9	64.1	5	0.01	0	0.004
10	64.3	20	0.02	0.002	0.005
11	64.4	30	0.02	0.009	0.007
12	64.5	20	0.03	0.005	0.008
13	64.6	15	0.04	0	0
15	75.1	30	0.03	0.005	0.005
Ephemeral Dry Wash Total:		**120**	**0.50**	**0.02**	**0.03**
Perennial Stream					
Calf Creek	74.5	300	0.09	0.06	

Feature	MP	Linear Impact (FT)	Acres within Project Study Area	Permanent Impact Area	Temporary Impact Area
Wetland					
Wet Meadow	74.5 – 74.6	N/A	1.16	0.10	0.35
Total					
TOTAL IMPACT:	**420**	**420**	**1.89**	**0.18**	**0.38**

Ephemeral Dry Washes

Improvements to the Hole-in-the-Rock-Road intersection would require extending existing culverts at five dry washes (9 through 13). Improvements to the Calf Creek Recreation Area intersection would require extending one culvert at Dry Wash 15. The total length in existing culverts at these six washes is 700 feet. The Build Alternative would increase the culvert length by an additional 120 feet. Approximately 0.02 acres of ephemeral dry wash would be permanently filled.

Calf Creek

Replacement of Calf Creek Bridge would include the realignment of approximately 300-linear feet of Calf Creek. The old channel would be filled, resulting in a 0.06 acre perennial stream impact. The old channel is immediately adjacent to the wet meadow and is expected to convert to a wetland over time. A new channel with a more gradual transition from the west side to the east side of the road would be created to reduce scouring. The new channel would be dredged through the adjacent wet meadow, resulting in a 0.05 acre wetland impact. In effect, the perennial stream and wetland areas would be swapped. Over time, there would be no net loss to the stream or wetland system due to channel realignment. Still, these areas are included in the permanent impact measurements. Impacts resulting from replacement of Calf Creek Bridge are also discussed in Section 3.9.

Avoidance and minimization of impacts to Calf Creek were considered during preliminary design. Avoidance of impacts to Calf Creek would not meet the project's purpose to improve safety and infrastructure where the roadway facilities are deficient or deteriorating. Without relocating the Calf Creek channel, scour would continue to attack the southwest abutment whether or not the bridge was replaced. An alternative bridge location was considered, shown in Figure 2.3. This would have relocated Calf Creek to an old channel section. It was eliminated for the following reasons:

- Greater wetlands impacts (0.16 acres instead of 0.10 acres)
- Greater stream channel impact (600-linear feet instead of 300-linear feet)
- Longer box culvert (150 feet instead of 55 feet)

Wetlands

The Build Alternative would result in 0.10 acres of permanent impacts and 0.35 acres of temporary impacts to the wet meadow wetland adjacent to Calf Creek. Approximately 0.05 acres would be filled under roadway embankment, and another 0.05 acres would be dredged and replaced by a realigned Calf Creek channel, resulting in a total of 0.10 acres of permanent impact. As discussed above, the perennial stream and wetland areas would be swapped. Although these areas are still included in the permanent impact measurements, over time there would be no net loss to the stream or wetland system due to channel realignment. However, the 0.05 acres filled for roadway widening would be permanently lost.

Avoidance and minimization measures were considered in the preliminary design. The roadway cross section at the Calf Creek Bridge approach was modified to include a barrier. Similar to other locations along the corridor where barrier replacement is proposed, an aesthetic barrier would be used, as shown on Figure 2.2. Including a barrier in the cross section allows the roadway fill slopes to be steeper (2:1). This results in a narrower footprint where the road is adjacent to wetlands.

Temporary Construction Impacts

Construction activities would result in temporary impacts to jurisdictional features. For example, areas adjacent to the roadway would be disturbed by heavy equipment but could be restored after construction.

As shown on Figure 3.12—Sheets 3 and 6, approximately 0.03 acres of ephemeral wash would be temporarily impacted by construction activities. Approximately 0.02 acres would be temporarily disturbed by equipment used to construct interchange improvements at Hole-in-the-Rock Road. Less than 0.01 acres would be temporarily disturbed by equipment used to construct interchange improvements at the Calf Creek Recreation Area.

As shown on Figure 3.12—detail sheet 7, approximately 0.26 acres of wetlands adjacent to the road would be temporarily disturbed by equipment used to construct the Calf Creek Bridge and roadway approach. Approximately 0.09 acres of wetlands adjacent to the new Calf Creek channel would be temporarily disturbed by equipment used to dredge the channel. The total temporary impact to wetlands would be approximately 0.35 acres.

Mitigation

Conceptually, mitigation for impacts to dry washes includes the placement of loose riprap at culvert inlets and outlets to dissipate energy and prevent erosion. A Section 404 permit will be obtained prior to discharging dredged or fill materials into jurisdictional waters, including ephemeral dry washes. It is anticipated that a Nationwide 404 permit will be required for impacts to dry washes. The project will comply with mitigation requirements and other conditions outlined in the Section 404 permit.

Mitigation for impacts and realignment of Calf Creek will be addressed through requirements of USACE 404 and DWQ UPDES permits and the use of BMPs. Prior to constructing the new channel, wetland topsoil will be stripped from the areas to be disturbed and will be stockpiled. The old channel will be filled in with a final grade elevation matching the wet meadow. Disturbed areas in or adjacent to wet meadows will be spread with the stockpiled wetland topsoil. The microorganisms and seeds in this topsoil will promote wetland vegetation.

Wetland mitigation is expected to consist of enhancing the stream bank and wetlands that are temporarily impacted by construction. Tamarisk and Russian olive trees will be removed, and disturbed areas will be replanted with native cottonwood trees and willows, increasing wildlife habitat value. A Section 404 permit will be obtained prior to discharging dredged or fill materials into jurisdictional waters, including wetlands. USACE will determine whether an individual or Nationwide 404 permit will be required. The project will comply with mitigation requirements and other conditions outlined in the Section 404 permit.

BMPs will be implemented during roadway construction to assure that creeks, washes, wetlands, and vernal pools are protected from disturbed areas' sediment laden runoff. Environmental and

silt fencing will be placed to protect vegetation and prevent disturbance beyond specified limits of construction. Mitigation for impacts to water quality from temporary construction activities is discussed in Section 3.9.

Disturbed areas would be recontoured to match the pre-disturbed condition and revegetated. UDOT Standard Specifications 02912 Topsoil and 02922 Seed, Turf Seed, and Turf Sod will be included in the construction contract documents.

3.12 WILDLIFE AND THREATENED AND ENDANGERED SPECIES

Regulatory Setting

The Endangered Species Act (ESA) of 1973 (16 USC 1531 to 1543) is the primary legislation that affords federal legal protection to threatened and endangered species in the United States. The USFWS, along with the National Marine Fisheries Service, is responsible for administration of the ESA. The ESA provides for conservation plans, recovery plans, designation of critical habitat, and consultations regarding listed species. Section 7 of the ESA directs all federal agencies to use their existing authorities to conserve threatened and endangered species and, in consultation with the service, to ensure that their actions do not jeopardize listed species or destroy or adversely modify critical habitat. Section 7 applies to management of federal land as well as other federal actions that may affect listed species, such as federal approval of private activities through the issuance of federal permits, licenses, grants, or other actions.

The Migratory Bird Treaty Act of 1918 (16 USC 701 to 715s) and associated amendments provide for the protection of migratory birds and their parts—including eggs, nests, and feathers. Federal agencies are directed to ensure that federal actions are not likely to have a measurable, negative effect on migratory birds. Also, the Eagle Protection Act of 1940 (16 USC 668) specifically protects bald eagles and golden eagles. The *Utah Field Office Guidelines for Raptor Protection from Human and Land Use Disturbances* establishes guidance for raptor protection locally.

The Fish and Wildlife Conservation Act of 1958 and amendments (16 USC 2901 to 2911) encourage coordination between federal, state, local, and private agencies for the conservation of fish and wildlife. In Utah, federal regulations are used to protect wildlife. However, the Utah Division of Wildlife Resources (DWR) of the Department of Natural Resources plays an important role in managing Utah's wildlife. DWR oversees and manages the state's hunting and fishing programs; maintains the state's sensitive plant list and oversees programs to prevent these plants from becoming listed as threatened or endangered; and maintains the Utah Conservation Data Center, which is a central repository for Utah biodiversity information. Information stored in this repository is a collection of data from many sources including: DWR, Utah Reclamation Mitigation and Conservation Commission, the U.S. National Park Service, USFS, USFWS, BLM, Utah State University, University of Utah, Brigham Young University, the Nature Conservancy, NatureServe, various museums, and numerous individuals. The Utah Natural Heritage Program maintains a database of the recorded occurrence locations of federally listed and Utah sensitive species.

Affected Environment

The *Grand Staircase-Escalante National Monument Management Plan* quotes 362 species of vertebrate animals and 1,112 species of invertebrates as having been identified within the monument boundaries. The most effective way to protect wildlife is to preserve their natural habitat.

Numerous land designations have been made by BLM and other agencies to preserve wildlife habitat in the region of the Build Alternative.

The monument includes 1,870,800 acres of land designated in 1996 by President Clinton as a national monument to provide federal protection of this relatively undisturbed region. The monument proclamation directed BLM to manage the monument as an outdoor laboratory to study scientific and cultural resources. The BLM was also directed to acquire lands within the boundaries from SITLA and two large coal leases. These acquisitions, made in 1999, improved the ability of the BLM to manage the land within the monument boundaries as a natural area.

The plan designates land within the monument for specific management objectives. Four zones have been designated for the purpose of managing visitation and other uses. These include the Frontcounty Zone, which makes up 4 percent of the monument; the Passage Zone, which makes up 2 percent of the monument; the Outback Zone, which makes up 29 percent of the monument; and the Primitive Zone, which makes up 65 percent of the monument.

Highways 12 and 89 are within the boundaries of the Frontcountry Zone, which includes 78,056 acres. This zone is the focal point for monument visitation because it provides day-use opportunities close to adjacent communities. This zone accommodates the primary interpretation, waysides, trails, and associated facilities necessary to feature monument resources. Projects and resources within this zone are evaluated and managed for visitation purposes. The Primitive Zone, which includes 1,211,386 acres, is intended to provide an undeveloped, primitive, and self-directed visitor experience without motorized or mechanized access. Protection of wildlife resources by limiting human interaction is a secondary benefit.

To protect potential wilderness values, BLM has also designated land within the monument boundaries as WSAs. In designated WSAs, no new surface disturbing activities or placement of permanent structures are permitted. There are currently 16 WSAs within the monument, encompassing approximately 881,997 acres.

Wildlife corridors for most species overlay riparian corridors. As noted in Section 3.10, special protection is provided for some of the monument's riparian systems under the Wild and Scenic Rivers Act. Other riparian systems receive protection as well. As stated in the *Grand Staircase-Escalante National Monument Management Plan:*

> The overall objective with respect to riparian resources within the monument is to manage riparian areas so as to maintain or restore them to properly functioning conditions and to ensure that stream channel morphology and functions are appropriate to the local soil type, climate, and landform.

In December of 2006, a meeting was held with the Grand Staircase-Escalante National Monument wildlife biologist and Alpine Environmental personnel to discuss the Build Alternative and potential impacts to listed threatened, endangered, and candidate species. Federally listed species with potential to occur in this region are listed in Table 3.14.

Table 3.14: Federally Listed Threatened, Endangered, and Candidate Species in Garfield County

Common Name	Federal Status*	Brief Habitat Description
Plants		
Maguire Daisy	T	Canyon bottoms and mesa slopes and summits in Wingate and Navajo form. At 4,999 – 6,614 ft. in Emery and Wayne Cos. and Garfield Co.
Ute Ladies'-Tresses	T	Moist to very wet meadows, along streams, in abandoned stream meanders, and near springs, seeps and lakeshores. Grows in sandy or loamy soils typically with gravels from 3,996 – 6,504 ft.
Jones Cycladenia	T	Gypsiferous saline soils on the Chinle, Cutler, and Summerville Formations. In cool desert shrub and juniper, common between 4,400 – 6,000 ft. Endemic to Emery, Garfield, Grand, Kane Cos., UT, and Coconino Co., AZ.
Autumn Buttercup	E	Sedge/grass meadow habitat at 6,440 ft. Endemic to Garfield Co., Utah.
Fish		
Humpback Chub	E	Whitewater areas in the Green, Colorado, and White Rivers. Spawns in shallow backwater areas with cobble substrate.
Bonytail	E	Native to Colorado River system. Prefers eddies, pools, and backwaters near swift current in large rivers.
Colorado Pikeminnow	E	Found in upper Colorado River system. Adults prefer medium to large rivers. Found in habitats from deep turbid rapids to flooded lowlands. Young prefer slow-moving backwaters.
Razorback Sucker	E	Slow backwater habitats and impoundments.
Birds		
California Condor	E	Prefers mountainous country at low and moderate elevations, especially rocky and brushy areas near cliffs. Colonies roost in snags, tall open-branched trees or cliffs, often near important foraging grounds. Eats carrion, usually large items such as dead sheep, cattle, and deer; typically 2 – 3 lbs. per day. May live 45 yrs.; need 5 – 7 yrs. to become sexually mature. One egg laid every other year. Egg is laid on floor of a cliff cavity or cave or in crevice among boulders on steep slope, February or March. Incubation lasts 8 weeks. Young fly at about 5 – 6 months; may be partially dependent on parents for up to a year.
Bald Eagle	De-listed July 9, 2007	Nesting habitat requirements include large bodies of water, abundant fish supply, and snags and perches. May winter in a variety of upland habitats with source of terrestrial prey or carrion.

Common Name	Federal Status*	Brief Habitat Description
Yellow-Billed Cuckoo	C	Riparian obligate. Feeds mainly on large insects that they glean from tree and shrub foliage; occasionally on lizards, frogs, and eggs of other birds; rarely on berries and fruit. Nesting habitat is classified as dense lowland riparian characterized by a dense sub-canopy or shrub layer (regenerating canopy trees, willows, or other riparian shrubs) within 300 ft. of water. Overstory in these habitats may be either large, gallery-forming trees (30 – 80 ft.) or developing trees (9 – 30 ft.), usually cottonwoods. Nesting habitats are found at low to mid-elevations (2,286 – 5,547 ft.) in Utah. Cuckoos may require large tracts (100 – 200 acres) of contiguous riparian nesting habitat.
Mexican Spotted Owl	T	Nests in narrow canyons and slot canyons with available nesting sites.
Southwest Willow Flycatcher	E	Riparian obligate, requires tracts of riparian vegetation with a canopy and sub-canopy proximate to water features.
Mammals		
Utah Prairie Dog	T	Found in arid regions of south-central and southwestern Utah. Prefers short-grass prairie; forms colonies and feeds on flowers, seeds, grasses, leaves, and insects
Brown (Grizzly) Bear	T	May have historically occurred in Garfield County but has been extirpated from the State of Utah.

**Federal Status:*
- *T: Threatened is defined as species that is likely to become endangered in the foreseeable future.*
- *E: Endangered is defined as a species that is endangered of becoming extinct throughout all or a significant portion of its range.*
- *C: Candidate is defined as a species that has been proposed for listing as threatened but federal protection has not been proven warranted.*

Source: Welsh 1993 and Atwood 1991

Sensitive Species

DWR maintains Utah's sensitive species list. Table 3.16 below lists sensitive plant and vertebrate species of Garfield County. The Utah Natural Heritage Program was consulted concerning recorded occurrences of federally listed threatened, endangered, and Utah sensitive species within the project area. Utah Natural Heritage Program lists recent recorded occurrences of the bald eagle, bluehead sucker, Colorado River cutthroat trout, flannelmouth sucker, and roundtail chub within one-half mile radius of SR-12 from Escalante to Boulder.

Table 3.15: State Sensitive Species of Garfield County, Utah

Common Name	Status*	Brief Habitat Description
Plants		
Aquarius Indian Paintbrush	SPC	Occurs on the Aquarius Plateau and on the Boulder Top in Garfield and Wayne County at elevations from 9200 – 11,300 ft. A member of the figwort family, blooms from late June to August. Perennial herb, 5 – 12 in. tall.
Amphibians		
Arizona Toad	SPC	Inhabits streams, washes, irrigated crop lands, reservoirs, and upland adjacent to water in isolated areas of the southwest U.S. In Utah, found in the southwestern part of the state.

Common Name	Status*	Brief Habitat Description
Western Toad	SPC	Slow-moving streams, wetlands, desert springs, ponds, lakes, meadows, and woodlands. Inactive during cold winter months. Utilize burrow and feed on invertebrates, such as ants, beetles, and grasshoppers. Tadpoles filter algae from the water or feed on detritus.
Fish		
Bluehead Sucker	CS	Upper Colorado River system including the Escalante River.
Bonneville Cutthroat Trout	CS	Several Utah populations in Bear Lake and Strawberry Reservoir. Can be found anywhere from high-elevation mountain streams to low-elevation grassland streams. Hybridizes with non-native rainbow trout.
Colorado River Cutthroat Trout	CS	Naturally occurring only in high-elevations headwater streams of the Upper Colorado River. Hybridization with non-native rainbow trout continues to threaten species. Hatchery raised populations have been released into lakes in the Uinta Mountains.
Flannelmouth Sucker	CS	Colorado River and in the river's large tributaries, including the Escalante River. Prefers deep water pools of slow-flowing, low-gradient reaches. Benthic forage for algae and invertebrates. Typically spawns early spring (in this region, March 15 – April 15).
Leatherside Chub	SPC	Small minnow native to streams and river of the southeastern portion of the Bonneville Basin.
Roundtail Chub	CS	In pools near strong currents in the main-stem Colorado River and in the river's large tributaries, including the Escalante. Feeds on aquatic and terrestrial insects, mollusks, other invertebrates, fish, and algae.
Birds		
American White Pelican	SPC	Greater Salt Lake/Utah Lake ecosystem. Only known breeding colony is on Gunnison Island of the northern arm of the Great Salt Lake.
Burrowing Owl	SPC	Nest in ground burrows of prairie-dogs or other fossorial mammals.
Long-Billed Curlew	SPC	Grassland and wetland habitats, particularly the Great Salt Lake ecosystem.
Lewis's Woodpecker	SPC	Cavity nester in tall, often dead, trees. Typically ponderosa pines, cottonwood, or sycamore. Also utilizes utility poles and tree stumps.
Northern Goshawk	CS	Requires closed canopy forests for nesting. Yearlong resident over most of the state.
Ferruginous Hawk	SPC	Widely distributed in Utah. Rely heavily on jack rabbit populations for prey. Additional prey include ground squirrels and prairie-dogs. Utilize ecotone between Pinyon Juniper communities and shrubsteppe or grasslands.
Three-Toed Woodpecker	SPC	Requires northern coniferous and mixed conifer forests above 8,000 ft.
Short-Eared Owl	SPC	Ground nesting species of open country, grasslands, and tundra. Dependant on abundance of small mammals, such as voles, for prey.
Mammals		
Allen's Big-Eared Bat	SPC	Rocky cliffs and riparian in woodland and scrubland regions, insectivore, nocturnal, roosts in caves or rock crevices.
Townsend's Big-Eared Bat	SPC	Requires caves, mines, and similar structures for roosting. Known to occur in abandoned mines.

Common Name	Status*	Brief Habitat Description
Spotted Bat	SPC	Habitat range from deserts to forest mountains, insectivore, nocturnal, roosts and hibernate in caves and rock crevices.
Fringed Myotis	SPC	Roosts in caves, abandoned mines, and buildings. Roosts in tightly packed clusters of individuals in the open. Found in all elevations. Oak and pinyon the most common habitat.
Big Free-Tailed Bat	SPC	Prefers rocky and woodland habitats of the southern half of the state. Roosts in caves, abandoned mines, old buildings, and rock crevices.
Greater Sage Grouse	SPC	Requires sagebrush habitat.
Pygmy Rabbit	SPC	Requires deep soils and tall, dense sage brush (20 – 30 in.) with high shrub cover (21% – 36.2%).
Kit Fox	SPC	Arid desert landscapes. Uses year-round dens. Water development may play a role in declining populations by extending the ranges of other larger canids (coyote, red-fox), which prey upon kit fox.
Reptiles		
Common Chuckwalla	SPC	Only found in southern portions of Utah. Utilizes rocks for sun-basking sites and rock crevices for shelter.
Desert Night Lizard	SPC	Only occurs in southern portions of the state. Extremely secretive, rarely seen. Discovered hiding under Joshua tree limbs and similar cover.
Invertebrates		
Black Canyon Pyrg	SPC	Occurs in complex of spring in Black Canyon, which is in the East Fork of the Sevier River. Presumed to be strictly endemic.
Utah Physa	SPC	Currently inhabits three pools in Cache and Box Elder County. Additional inventories are needed throughout the state.

SPC: Wildlife species of concern usually due to declining populations.
CS: Conservation species receiving special management under a conservation agreement to preclude the need for federal listing.

Source: DWR 2006; Welsh 1993; and Atwood 1991

A biological assessment was completed by Alpine Environmental Resources, dated September 2007. Information was gathered from current literature, technical reports and surveys, and through personal communication with the monument wildlife biologist. On January 21 and May 18, 2007, detailed pedestrian surveys were conducted to identify threatened, endangered, and candidate species as well as for each suitable habitat. The survey areas are defined by the 14 spot improvements included in the Build Alternative and are shown on Figure 3.1.

This survey identified a suitable, currently unoccupied habitat for the bald eagle and the Mexican spotted owl. Suitable habitat for other threatened, endangered, and candidate species listed in Table 3.14 was not found. Therefore, these two species are discussed in detail below.

Since the bald eagle has been de-listed, agency concurrence with affect determination and Section 7 consultation is not warranted. Upon delisting, the USFWS will continue to work with state wildlife agencies to monitor eagles for at least five years, as required by the ESA. To prevent the need for re-listing, efforts to avoid negative impacts to the bald eagle are still considered. Specific impacts to the bald eagle, Mexican spotted owl, and wildlife in general are described below.

Bald Eagle

The bald eagle is endemic to North America and occurs in all of the lower 48 states. It was first listed as threatened on March 11, 1967. A recovery plan was adopted on July 29, 1983. The bald eagle population has risen to a point where the species was de-listed on July 9, 2007. As discussed above, USFWS will work with state wildlife agencies to monitor the species until 2012. Because suitable habitat was identified in the survey area, the bald eagle is discussed in detail.

Habitat for the bald eagle is near large, open bodies of water where there is a plentiful supply of fish and large trees for nesting and roosting. These birds are a monogamous species. They mate for life and will return to the same nest year after year to lay eggs and raise their young. The female will lay one to three eggs, and both parents share in the incubation, which lasts about 35 days. The fledgling will leave the nest generally within 12 weeks but remains dependant on parents until flying skills and muscles are better developed.

Bald eagles are somewhat migratory, moving south from the breeding habitat for the winter range. In Utah, there is a large population of wintering bald eagles scattered over the state with the majority near the Great Salt Lake. The eagles begin arriving in November—the largest number showing up in January and February. The main diet for bald eagles is fish, but, during winter months, road-kill and other carrion become an important food source. The eagles begin the return journey north in March. Several breeding pairs have been found to remain in Utah throughout the year. The DWR monitors these nesting pairs as well as the migratory population.

According the USFS Escalante Ranger District, wintering bald eagles have been observed in farm areas north of Boulder during surveys conducted along the project area. These birds were reportedly perched in cottonwood trees in fields. Bald eagles are also reported to winter along Calf Creek. According to personal communication with Terry Tolbert, a wildlife biologist for the monument, no bald eagles were reported in the area during the past winter (2006 to 2007).

Road-kill within the proposed project area presents potential scavenging opportunities for wintering bald eagles and other raptors. No bald eagle foraging of road-kill along SR-12 within the project area has been recently reported to the monument personnel. Existing disturbances include vehicle traffic, use of agricultural equipment in crop fields, and general presence of people and vehicles along SR-12 and recreational areas.

Mexican Spotted Owl

Because suitable Mexican spotted owl habitat—but not critical habitat—was identified in the survey area, they are discussed in detail here. On April 3, May 18, June 20, and July 5, 2007, Mexican spotted owl surveys were conducted by Terry Tolbert, the Grand Staircase-Escalante National Monument wildlife biologist. The biological assessment, dated September 2007, includes results of one year of Mexican spotted owl survey. No spotted owls were discovered during 2007 surveys. During the summer of 2008, Terry Tolbert completed the second year of survey for Mexican spotted owl. The survey was completed in compliance with the accepted survey protocol as outlined in the 1995 USFWS Mexican Spotted Owl Recovery Plan. The results of the second year of survey determined that no spotted owls are within the area of potential affect. Great-horned owls have been noted just north of the Calf Creek Recreation Area, which typically indicates no presence of Mexican spotted owls since great-horned owls prey upon the spotted owl.

The Mexican spotted owl was listed as threatened on March 16, 1993. USFWS prepared a recovery plan in 1995, and the final critical habitat designation was made on January 15, 2001. USFWS has now designated approximately 4.6 million acres of critical habitat for the owl in Arizona, Colorado, New Mexico, and Utah on federal lands. There are five critical habitat units in southern Utah covering approximately 2.3 million acres of federal land. The project area does not fall within the designated critical habitat but is adjacent to two parcels. These parcels are roughly 20 miles east and 30 miles west of the SR-12 project areas of disturbance, as shown on Figure 3.13.

The range for the Mexican spotted owl stretches from southern Utah and Colorado, south through the mountains of Arizona, into New Mexico and parts of Texas, and then into the mountains of Central Mexico. Because of the diversity of geographical features within its range, the distribution of the Mexican spotted owl is naturally fractured. In the southern regions of the range, the owls tend to nest in old growth forests with closed canopy. In the northern region, steep-sided, rocky canyons are the main nesting sites. In Utah, Mexican spotted owls are found in the slot canyons of the Colorado Plateau. The largest number of owls known in Utah occurs in the canyons of Zion National Park. Mexican spotted owls do not build their own nests. They roost on cliff ledges, in stick nests built by other birds, on debris platforms in trees, and in tree cavities. In the canyons of southern Utah, most nests are in caves or on cliff ledges. It is believed that the owls prefer the closed-canopy forests and steep canyons because of the cooler microclimate of these areas.

Wildlife

The area of influence includes high priority winter mule deer habitat. New Home Bench, west of SR-12, is high priority summer elk habitat. During the winter months, deer are frequently seen between MP 61 and MP 67, an area known as "Big Flat," and between MP 82 and MP 86, an area known as New Home Bench. In 2005, the CSC discussed wildlife fencing, particularly for New Home Bench. It was discovered that a local rancher installed a cattle fence around the wash near MP 62. This installation may reduce animal kills in the Big Flat area. However, cattle fencing does not typically restrict mule deer. Based on the committee discussions, plans for wildlife fences along SR-12 were discarded. The footprint of the Build Alternative would result in very little post-construction change in deer and elk forage.

Numerous migrant birds and raptors utilize the Calf Creek riparian zone. No raptor nests were noted in the area of impact during survey. One peregrine falcon eryie is located near the Escalante River. There is also a nest in the Calf Creek Canyon that has not been used for the last two or three years.

The bluehead sucker, round-tail chub, and flannel mouth sucker—all Utah sensitive species—are known to occur in the Escalante River, which is approximately one-half river mile downstream from the Calf Creek Bridge. Numerous lizard and bat species find cover in the cracks and crevices of sandstone formations within the zone of influence. A bat colony was noted, due to evidence of guano, under an alcove near MP 75.4, east of the Calf Creek Recreation Area, approximately 650 feet east of the existing road.

Impacts

No-Build Alternative

Under the No-Build Alternative, disturbances associated with road maintenance and existing traffic would continue. Continued deterioration of the Calf Creek Bridge would eventually result

in bridge failure. Without an alternate transportation route, an emergency repair would be required, and a wildlife sensitive construction window may not be possible in an emergency. Similarly, deterioration of embankment and Jersey barrier would eventually result in roadway failure. Emergency repairs would require blasting, and this too could mean that a wildlife sensitive construction window may not be possible. Although no known active nesting sites are within a half mile of proposed improvements, it is possible that the peregrine falcon nest in Calf Creek Canyon may become active again.

Build Alternative

Bald Eagle

Due to the small area of disturbance from the project and the wide range of foraging habits of bald eagles, the proposed improvements would not jeopardize individual or populations of bald eagles nor alter habitat suitability of the general area as wintering habitat for bald eagles. The biological assessment completed by Alpine Environmental Resources, dated September 2007, concludes a "not likely to affect" determination for the bald eagle or its wintering habitat. Since the bald eagle has been de-listed, agency concurrence with affect determination and Section 7 consultation is not warranted. Upon de-listing, USFWS will continue to work with state wildlife agencies to monitor eagles for at least five years, as required by the ESA.

Mexican Spotted Owl

The biological assessment completed by Alpine Environmental Resources, dated September 2007, concludes a "not likely to adversely affect" determination for the Mexican spotted owl. A "no effect" determination was designated on Mexican spotted owl critical habitat. The USFWS recommended a spotted owl survey in compliance with USFWS accepted protocol, which requires two years of survey to ensure there are no nesting sites within one-half mile of the project area. The biological assessment includes results of a Mexican spotted owl survey for one year. No spotted owls were discovered during 2007 surveys. However, since an additional year of survey was required in the summer of 2008 to meet accepted protocol due to the presence of suitable habitat within the area of influence, a "not likely to adversely affect" determination was made in the 2007 biological assessment. USFWS concurred with this determination on February 27, 2008. Subsequent to the "not likely to adversely affect" determination, the second year of Mexican spotted owl survey in summer of 2008 determined that no spotted owls are within the area of potential affect. Correspondence is included in Appendix A.

Wildlife

Replacement of the Calf Creek Bridge would result in removal of one riparian tree on the west side of SR-12 and possibly a second tree on the east side of SR-12. Post-construction, there would be very little change to avian foraging and nesting habitat. In light of the surrounding vast undeveloped, natural region, the Build Alternative would have an almost immeasurable impact on the wildlife habitat.

Temporary Construction Impacts

Construction noise would displace some of the local inhabitants during construction. However, as discussed previously, thousands of acres of preserved suitable habitat are adjacent to the impacted area for refuge. Although construction within one-half mile of a bald eagle winter roost site could be considered a disturbance, there are no known nest sites in the vicinity of the project. Although construction within one-half mile of an active peregrine falcon nest could be considered a disturbance, the nest in Calf Creek Canyon has not been used for the last two or three years.

Some mortality of small wildlife in the construction footprint would be expected. Avian species in the immediate area would flee to adjacent suitable habitat during construction. Turbidity of Calf Creek would increase during construction. Increased turbidity from construction would be similar to the effects of a flash flood, which is common in this region. Local fish populations are adapted to turbid waters. Post-construction local wildlife populations are expected to return to habitats immediately adjacent to SR-12.

Mitigation

Mitigation for this project includes efforts to minimize impacts to threatened, endangered, and candidate species as well as wildlife in general. Specific mitigation measures include the following:

- The peregrine nest in Calf Creek Canyon will be monitored by the BLM biologist prior to construction to determine if the nest becomes actively used again.
- Stream diversion or channel relocation of Calf Creek will not be completed during fish migration and spawning season—March 15th through April 30th. Construction of the Calf Creek Bridge during late summer and early fall would be the least disruptive on local wildlife of the riparian zone.
- Calf Creek Bridge will be replaced with a box culvert or with an open-bottomed bridge. If the box culvert option is chosen, its bottom would be placed at an elevation that would retain natural stream substrates and maintain natural conditions. The structure will be designed to prevent the formation of a fish barrier through the erosion process.
- Efforts will be made to avoid riparian tree removal during design and construction of the Calf Creek Bridge.
- Silt fencing, which will define the construction area and prevent incidental impacts to the riparian zone, will be installed prior to the construction of the Calf Creek Bridge.
- Stream bed elevations for the Calf Creek realignment will match preconstruction conditions and no rise of the floodplain will be permitted.
- Native willow and cottonwood saplings from a local source will be planted on the Calf Creek stream bank to revegetate and stabilize the bank. In this manner, all disturbed areas will be recontoured to match the pre-disturbed condition and revegetated. Also, appropriate BMPs will be implemented to stabilize soils and prevent excessive erosion of impacted areas while revegetation efforts take hold.
- Compensatory mitigation for impacts to the Calf Creek area will be defined in the Section 404 permit for the bridge replacement by the USACE.
- All contractors will be provided with environmental permit special conditions. The project engineer will complete monitoring for compliance with permit special conditions. Contractors will be required to report any special condition violations to the project engineer.

3.13 INVASIVE SPECIES

Regulatory Setting

EO 13112 Invasive Species, signed by President Clinton on February 3, 1999, requires federal agencies to combat the introduction or spread of invasive species in the United States. Invasive species—including their seeds, eggs, spores, and other biological material capable of propagating—are not native to the ecosystem and are capable of causing harm to the economy, environment, or human health.

"Noxious" is a legal term applied to plant species. Noxious weeds are invasive species that must be controlled by law. The Utah Noxious Weed Act, Title 04 Chapter 17 of the Utah Code and Constitution, requires that each county formulate and implement a countywide noxious weed control program designed to prevent and control noxious weeds.

Affected Environment

The Utah Department of Agriculture and Food (UDAF) publishes a list of officially designated noxious weeds for the State of Utah. There are currently 19 species on this statewide list, which must be controlled by law. County governments may also regulate noxious weeds; however, Garfield County has not generated a separate list.

Invasive species can include noxious weeds as well as other plants and animals that are not native. Because invasive species did not evolve in their current environment, they do not have natural predators to balance their reproduction and can spread rapidly.

There are 98 invasive species listed within the monument; the BLM botanist identified the following ten invasive species of greatest concern in the SR-12 project area:

- Russian knapweed *
- Scotch thistle *
- Whitetop *
- Russian-thistle
- Bindweed *
- Russian olive
- Cheatgrass
- Johnson grass *
- Tamarisk
- Puncture vine

  * Also a Utah noxious weed

Of the above listed species, four were identified within the project impact area as shown on Figure 3.1. There is an area on the north side of the road near MP 71, known as "The Tank," where Johnson grass has been established. Tamarisk and Russian olive are widespread in the Escalante River and Calf Creek drainages. From Calf Creek to the Escalante River, a project was recently undertaken by BLM to remove these species from the area. Russian thistle was also present at several locations.

Impacts

No-Build Alternative

The No-Build Alternative has the potential to spread invasive species during maintenance activities by way of vehicle movement or surface disturbance.

Build Alternative

The Build Alternative has the potential to spread invasive species during maintenance or construction activities by way of vehicle movement or surface disturbance. Bare disturbed soils have a high risk of noxious plant invasion.

Mitigation

UDOT Special Provision 02924S Invasive Weed Control specifies the BMPs to be used to control the spread of noxious weeds. BMPs include cleaning all earth-moving equipment prior to entering the project as well as locating and treating existing noxious weeds with herbicide. UDOT contract documents will specify that seed mixes used for landscaping and erosion control must be free of noxious weeds and other invasive plant species. Seed mixes will be approved by BLM's monument botanist.

Coordination with the Grand Staircase-Escalante National Monument botanist is required prior to ground disturbance at "The Tank." Prior to construction at this location, the Johnson grass will be sprayed. Herbicides will be applied carefully to avoid impacts to water quality. Herbicides used near water and wet areas for Johnson grass must have an "aquatic label."

3.14 CULTURAL RESOURCES

Regulatory Setting

Cultural resources include archeological resources (e.g., prehistoric and historic) and architectural and structural resources (e.g., buildings, roads, and bridges).

The National Historic Preservation Act (NHPA), as amended, sets forth national policy and procedures regarding historic and archeological properties, which are defined as districts, sites, buildings, structures, and objects included in or eligible for the National Register of Historic Places (NRHP). Section 106 of NHPA requires federal agencies to consider the effects of their undertakings on such properties and to do so following regulations issued by the Advisory Council on Historic Preservation (ACHP).

The criteria for evaluating the significance of resources for listing on the NRHP are outlined in 36 CFR 60.4, National Register Criteria. Sites must also be evaluated for integrity of location, design, setting, materials, workmanship, feeling, and association, as well as the following criteria:

- Criterion A. Associated with events that have made a significant contribution to the broad patterns of our history.
- Criterion B. Associated with the lives of persons significant in our past.
- Criterion C. Embodies the distinctive characteristics of a type, period, or method of construction; represents the work of a master; possesses high artistic values; or represents a significant and distinguishable entity whose components may lack individual distinction.
- Criterion D. Yields, or may be likely to yield, information important in prehistory or history.

A finding of effect (FOE) is made for each historic property and an overall project effect is determined. Effect is defined as alterations to the characteristics of a historic property qualifying it for inclusion in or eligibility for the National Register (36 CFR 800.16[i]). The project can result in a determination of "no historic properties affected," "no adverse effect," or "adverse effect," defined as follows:

- No Historic Properties Affected. Either there are no historic properties present, or there are historic properties present but the project will have no effect upon them.

- No Adverse Effect. The project's effects do not meet the criteria of adverse effect, or the project is modified or conditions are imposed to avoid adverse effects.
- Adverse Effect. The project will either directly or indirectly alter any of the characteristics that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association.

Affected Environment

The Escalante and Boulder area was first visited by Anglo-European's in the late 1700s and later settled by Mormon pioneers in the late 1800s. Prior to that, the area was occupied by early hunter-gatherers during the Paleoindian and Archaic stages (12,000 B.P. to 400 A.D.), and later, with the introduction of some small-scale farming, by the Fremont and Anasazi peoples (A.D. 1 to 1,200 A.D.). Within roughly the last 1,000 years, the area was occupied predominantly by the Southern Paiute people, hunter-gatherers, and part-time horticulturalists. Their cultural tradition is characterized by the use of rock shelters, wikiup dwellings, rock-filled roasting pits, conical-bottomed brownware ceramics, basketry, and stone tools.

The first documented European-American visitors to the area were Fathers Dominguez and Escalante who traveled through present-day Garfield County on their 1776 return trip to Santa Fe. Major J.W. Powell also explored the area, recording the geology and geography of eastern Garfield County.

Escalante City was founded in 1876 when residents of Panguitch decided to settle there. Boulder was founded in the 1890s when one homesteader donated land for a school. Abundant timber supplied the first sawmills, and high-grade clay was used to build adobe homes. Farming was also a main industry as grains, such as corn and wheat, were made available by the fertile soil.

Public facilities and services were difficult to establish in the rugged terrain. An irrigation district, formed in 1877, built dams along the Escalante River; the dams have since washed away. The Civilian Conservation Corps (CCC) played a significant part in establishing the infrastructure in the area by building structures and roadways, including a section of roadway between Boulder and Escalante that was built from 1934 to 1940.

Power did not reach the area until the mid-1900s, when Garfield and Kane counties created the GarKane Power Association. A hydroelectric plant was constructed near Boulder and energized in 1958 and continues to supply power and jobs to the citizens of Boulder.

The main industries in Garfield County have traditionally been livestock, farming, and dairying. The early settlers farmed corn and wheat and relied on wild food sources such as "blue" potato, strawberries, and chokecherries. Although small sawmills were built near Boulder and Escalante as early as the late 1800s, the timber industry became second only to livestock production as a source of wealth in the first post-war decades. In 1903, President Theodore Roosevelt created numerous forest reserves, and, in 1944, all the reserves in Garfield County were consolidated into the Dixie National Forest.

Tourism has since become the main industry in Garfield County. In 1996, President Clinton designated the Grand Staircase-Escalante National Monument. This, along with Bryce Canyon

National Park, the Dixie National Forest, Capitol Reef National Park, and the unique terrain attracts millions of visitors to the area each year.

The Build Alternative includes six spot improvements that fall into 14 discontinuous project improvement segments. The area of potential effects (APE) for archaeological resources is defined by each of these spot improvements. In consideration of both direct and indirect effects, the APE is defined as a 400-foot corridor (200 feet off centerline) and 100 feet from the beginning and terminus of each project segment. There is one area at MP 71.0 where the APE extends 300 feet off centerline (inside a sharp curve).

Historic and archeological resources were investigated through a literature search and intensive-level pedestrian survey. In March 2005, Montgomery Archaeological Consultants conducted a Class I existing data review of previous archaeological inventories at the Antiquities Section of the Division of State History for the entire length of SR-12. The Class I review covered a continuous two-mile wide corridor centered on SR-12 from Escalante to Boulder (an area larger than the APE).

Montgomery conducted an intensive-level cultural resource pedestrian survey along each improvement section between April 20 and May 15, 2007. The inventory width varied between 50 feet and 200 feet off the centerline, depending on the improvement proposed for each of the 14 sections. The survey area is shown on Figure 3.1. There is one area at MP 71.0 where the inventory width was 300 feet off the centerline; this area is shown on Figure 3.1—Sheet 3. A total of 50.2 acres was inventoried, 46.7 acres on BLM lands in the Grand Staircase-Escalante National Monument and 3.5 acres on SITLA.

The cultural resource inventory resulted in the identification of 16 sites within the APE, as shown in Table 3.16. Of the 16 identified sites, 11 are eligible for listing on the NRHP.

The determination of eligibility/finding of effect (DOE/FOE) for cultural resources was documented in a letter from the UDOT Region Four NEPA/NHPA specialist to the State Historic Preservation Officer, dated October 4, 2007 and included in Appendix A. Cultural resource locations are generally not identified in figures to protect the integrity of the site.

Table 3.16: Historic and Archeological Sites

Site	Description	Eligibility	Effect
42Ga5647	Prehistoric Lithic Scatter	Eligible: Criterion D	Adverse Effect (57,754 square ft. potentially affected)
42Ga6077	Prehistoric Temporary Camp	Eligible: Criterion D	No Effect
42Ga6078	Prehistoric Temporary Camp	Eligible: Criterion D	No Effect
42Ga6079	Prehistoric Lithic Scatter	Eligible: Criterion D	No Effect
42Ga6080	Prehistoric Lithic Scatter	Eligible: Criterion D	No Effect
42Ga6081	Prehistoric Lithic Scatter	Eligible: Criterion D	No Effect
42Ga6082	Prehistoric Rock Art	Eligible: Criteria C and D	No Effect
42Ga6083	Calf Creek Bridge Remnants	Not Eligible	No Effect
42Ga6084	Prehistoric Surface Quarry	Not Eligible	No Effect
42Ga6085	Prehistoric Surface Quarry	Not Eligible	No Effect
42Ga6086	Prehistoric Lithic Scatter	Eligible: Criterion D	No Effect
42Ga6087	Prehistoric Lithic Scatter	Eligible: Criterion D	No Effect
42Ga6088	Prehistoric Lithic Scatter	Eligible: Criterion D	No Effect
42Ga6089	Historic Power/Telephone	Not Eligible	No Effect

Site	Description	Eligibility	Effect
	Line		
42Ga6090	SR-12 Road Segments and Features	Not Eligible	No Effect
42Ga6091	Escalante to Boulder Road Segments and Features	Eligible: Criteria A and C	No Adverse Effect

Impacts and Finding of Effect

No-Build Alternative

Under the No-Build Alternative, no sites would be affected.

Build Alternative

Under the Build Alternative, two of the eleven historic/archeological sites will be affected: 42Ga5647 (Prehistoric Lithic Scatter) and 42Ga6091 (Escalante to Boulder Road Segments and Features). The remaining nine NRHP eligible sites will be avoided during construction.

Site 42Ga5647: Prehistoric Lithic Scatter

Site 42Ga5647 is considered eligible for the NRHP under Criterion D because it has the potential to yield additional information about the prehistory of the area. The Build Alternative would affect the northeast corner of the site, resulting in an adverse effect.

Site 42Ga6091: Escalante to Boulder Road Segments and Features

Site 42Ga6091 is what remains of the Escalante to Boulder road. The site contains twelve features, including two discontinuous and abandoned road segments, three wet and/or dry laid rock retaining walls, two galvanized steel culverts, and six hand-dug drainage features. Historic records indicate that the Escalante to Boulder road was constructed by the CCC between 1934 and 1940. The road provided the first year-round, automobile accessible route between Escalante and Boulder.

Site 42Ga6091 is considered eligible for the NRHP under Criterion A because it is associated with the events that have made a significant contribution to the broad patterns of our history. It also is considered eligible for Criterion C because of the CCC construction effort, which embody the distinctive characteristics of a type, period, or method of construction and represent a significant and distinguishable entity whose components may lack individual distinction.

Under the Build Alternative, the site would be affected by the widening of the road near the location of the hand-dug cut drainage ditches. However, since relatively small portions of the ditches will be removed, the actions would not affect the integrity or criteria that make the site eligible for the NRHP; thus, UDOT has made a determination of no adverse effect for Site 42Ga6091.

Based on the DOE and under consideration of the potential impacts to historic and cultural properties, UDOT has determined that the proposed project will have an overall adverse effect on historic and archeological properties.

Mitigation

Mitigation for Site 42Ga5647

A memorandum of agreement (MOA) was prepared to outline the mitigation measures for the site adversely affected, Site 42Ga5647. Under the *Scenic Byway 12 Signage and Interpretive Master Plan*, BLM would impact Site 42Ga5647 by constructing the Hogsback Day Use Recreation Area

adjacent to SR-12. The MOA between FHWA, BLM, and SHPO was developed to establish an efficient and effective means of resolving the adverse effects that would be caused by both projects. UDOT is participating as an invited signatory in the MOA, and the Paiute Indian Tribe of Utah is participating as a concurring party. FHWA consulted with the Hopi Tribe, the Kanosh Band of the Paiute Indians, the Shivwits Band of Paiute Indians, and the Kaibab Band of Paiute Indians; none of these parties chose to participate in the MOA. FHWA also notified ACHP of its adverse effect determination, and ACHP declined to participate. However, the Hopi Tribe specifically requested to review the draft treatment plan for Site 42Ga5647. A copy of the MOA is available in Appendix A.

The MOA specifically stipulates mitigation measures for the potential adverse effects to Site 42Ga5647. Mitigation will include one or more of the following measures to be jointly implemented by FHWA and BLM:

- Development of an interpretive exhibit at the day use recreation facility that presents elements of human prehistory germane to the area.
- Construction of an elevated boardwalk trail to minimize damage to the site from pedestrian traffic.
- Excavation of part or all of the site.

The determination of which measure will be implemented and how it will be implemented will be made before constructing improvements to SR-12 or the Hogsback Day Use Recreation Area.

Mitigation During Construction

For historic properties where construction activities will take place within 50 feet of the site—potentially Sites 42Ga6077, 42Ga6078, 42Ga6079, 42Ga6080, 42Ga6081, 42Ga6086, 42Ga6087, and 42Ga6088—temporary environmental fencing will be constructed to aid in the avoidance of the site.

For historic and archeological resources that could be potentially unearthed during construction, the UDOT Standard Specification 01355 Environmental Protection (Part 1.13—Discovery of Historical, Archaeological, or Paleontological Objects, Features, Sites, Human Remains, or Migratory Avian Species) applies. The specification states that the following must be done:

- If a suspected historic, archaeological, or paleontological item, feature, or site is encountered or if suspected human remains are encountered, the construction contractor must immediately suspend construction operations in the vicinity—a 100-foot buffer around the perimeter—of the discovery.
- The construction contractor must notify the on-site engineer verbally of the nature and exact location of the findings.
- The engineer must contact the region staff archeologist who will assess the nature of the discovery and determine the necessary course of action.
- The construction contractor must protect the discovered objects or features and provide written confirmation of the discovery to the engineer within two calendar days.
- The engineer must keep the contractor informed regarding the status of the restriction.

In the event that historic and archeological resources are encountered on lands within the monument, the BLM monument archaeologist will also be notified. Buried human remains that were not identified during the cultural resource investigation could inadvertently be unearthed during construction activities. If human remains of Native American origin are discovered

during ground disturbing activities, it is necessary to comply with 43 CFR 10—the Native American Graves Protection and Repatriation Act of 1990—or UAC 9-9-401 to 403— Utah Native American Graves Protection and Repatriation Act of 1992—depending on land ownership.

Consultations

In accordance with Section 106 of NHPA, UDOT has consulted with various parties regarding cultural resources. These consultations are as follows:

- April 2005. Letter requesting interest in becoming a consulting party and also requesting any information on historic properties of traditional religious and/or cultural importance in the project area.
- January 2007. Letter describing specific projects.
- August 2007. Results of the Class I existing data review.
- October 2007. DOE/FOE.

The letters were sent to the following:

- The Hopi Tribe
- The Paiute Indian Tribe of Utah
- Kanosh Band of the Paiute Indians
- Kaibab Band of the Paiute Indians
- Shivwits Band of the Paiute Indians
- SITLA
- Grand Staircase-Escalante National Monument—managed by BLM
- Dixie National Forest—invitation only
- Bureau of Indian Affairs—invitation only

Both the Paiute Indian Tribe and the Hopi Tribe requested continued consultation. The Hopi Tribe specifically requested to review the draft treatment plan for site 42Ga5647.

UDOT sent a DOE/FOE to SHPO on October 4, 2007. SHPO concurred with the DOE/FOE on November 8, 2007. Correspondence is included in Appendix A.

3.15 PALEONTOLOGICAL RESOURCES

Regulatory Setting

Paleontological resources (e.g., fossils) provide information about the history of life on earth. These include tracks and body remains of vertebrate and invertebrate organisms as well as plant fossils.

Under UAC 63-73-19, before expending state funds or approving an undertaking, each state agency must take into account the effect of the undertaking on a specimen that is included in or eligible for inclusion in the State Paleontological Register. A memorandum of understanding (MOU) has been executed between UDOT and the Utah Geological Survey (UGS) for compliance with the act.

Affected Environment

Paleontological resources are abundant within the Grand Staircase-Escalante National Monument, including world-class sites. Protection of these resources is one objective of the monument's management plan.

The Build Alternative includes six spot improvements that fall into 14 discontinuous project improvement segments. The APE for paleontological resources is defined by each of these spot improvements. In consideration of both direct and indirect effects, the APE is defined as a 400-foot corridor (200 feet off centerline) and 100 feet from the beginning and terminus of each project segment. There is one area at MP 71.0 where the APE extends 300 feet off centerline (inside a sharp curve).

Paleontological resources were investigated through a file search by Martha Hayden at UGS for the entire length of SR-12 (an area larger than the APE) on January 16, 2007. The search indicated that several significant invertebrate track sites from the Jurassic Kayenta and Navajo Formations have been recorded in the project area—some of which occur in road cuts immediately adjacent to SR-12. However, none of these sites is in the APE. Paleontological resource locations are generally not identified in figures to protect the integrity of the site. There is high potential for the discovery of additional track sites in Kayenta, Navajo, and Entrada Formations as well as some potential for the discovery of vertebrate body fossils in the Kayenta Formation. The letter from UGS, dated January 16, 2007, is included in Appendix A.

Paleontologist, Alden Hamblin, conducted a field survey on June 12, 2007. The survey area for paleontological resources is the same as the survey area for cultural resources and is shown on Figure 3.1. This field survey did not result in any new paleontological localities in the APE. Hamblin's field survey can be found in the appendix of the *Cultural and Fossil Resource Inventory for UDOT's SR-12 Improvement Project*.

Impacts

No-Build Alternative

No paleontological resources would be impacted by the No-Build Alternative.

Build Alternative

No known paleontological resources would be impacted by the Build Alternative. No construction activities are proposed in the vicinity of the known paleontological sites.

Temporary Construction Impacts

Given the abundance of paleontological resources in the monument, resources could be discovered during construction.

Mitigation

Prior to construction activities in or near areas where Navajo and Kayenta formations are exposed, a qualified paleontologist will survey the construction area. During construction, a qualified paleontologist will conduct periodic monitoring of the improvement area. In the event that paleontological resources are encountered prior to or during construction, the discovery procedures specified in UDOT Standard Specification 01355 Environmental Protection (Part 1.13—Discovery of Historical, Archaeological, or Paleontological Objects, Features, Sites, Human Remains, or Migratory Avian Species) and Section G of the MOU between UDOT and UGS pursuant to UAC

63-73-19 will be followed. In the event that paleontological resources are encountered on lands within the monument, the BLM monument paleontologist will also be notified.

For paleontological localities that could be potentially unearthed during construction, the UDOT Standard Specification Section 01355 Environmental Protection (Part 1.13) applies. The specification states that the following must be done:

- If a suspected historic, archaeological, or paleontological item, feature, or site is encountered or if suspected human remains are encountered, the construction contractor must immediately suspend construction operations in the vicinity—a 100-foot buffer around the perimeter—of the discovery.
- The construction contractor must notify the on-site engineer verbally of the nature and exact location of the findings.
- The engineer must contact the region staff archaeologist who will assess the nature of the discovery and determine the necessary course of action.
- The construction contractor must protect the discovered objects and provide written confirmation of the discovery to the engineer within two calendar days.
- The engineer must keep the contractor informed regarding the status of the restriction.

Consultation

UDOT coordinated with UGS regarding paleontological resources; copies of the correspondence are included in Appendix A.

3.16 HAZARDOUS WASTE

Regulatory Setting

Hazardous waste sites are regulated under the Resource Conservation and Recovery Act (RCRA), the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), and by the Utah Environmental Quality Code. The Utah Division of Environmental Response and Remediation (DERR) is charged with protecting public health and the environment through the cleanup of contaminated sites.

Hazardous and petroleum wastes encountered or disturbed by construction associated with the project can potentially cause the following effects:

- Spread due to construction activities or changes to subsurface conditions
- Affect the health and safety of construction workers
- Impact project cost and schedule
- Create long-term liabilities for the project owner

Additionally, hazardous or petroleum wastes can be introduced to the environment during construction due to leaks or spills of construction materials.

Affected Environment

DERR indicates that there is one leaking underground storage tank (LUST) site located at the northeast end of the project area:

- Burr Trail Café, Junction SR-12 and Burr Trail, Boulder. Status: Closed LUST site, I.D. #IWY. Also still operates as an active Underground Storage Tank (UST) site, DERR I.D. 6000678.

There are two additional UST sites along the corridor that store petroleum fuel but are not associated with known leaks or spills:

- Hills & Hollows Service, 1400840 West SR-12, Boulder, DERR I.D. 6000286.
- Canyon Country Chevron (also known as Nisson Canyon Country Store), 815 East Main (SR-12), Escalante, DERR I.D. 6000355.

The closed LUST site and the two UST sites are shown on Figure 3.14. No other known hazardous or petroleum waste sites are listed within the project limits on the DERR on-line database updated October 2007. Also, no environmental spills have been reported within the project limits, as listed on the DERR environmental spills list updated April 2007.

Impacts

No-Build Alternative

No hazardous waste would be encountered or generated by the No-Build Alternative.

Build Alternative

No known hazardous or petroleum waste would be encountered under the Build Alternative. No excavation is proposed in the vicinity of the closed LUST site in Boulder. Additionally, no excavation is proposed in the vicinity of the two existing UST sites along SR-12 between Boulder and Escalante. Therefore, any unknown or undocumented petroleum wastes associated with the fuel storage at these sites will not be encountered during construction of the Build Alternative.

Temporary Construction Impacts

Potential impacts from construction activities include the accidental release of hazardous materials from equipment (e.g., fuel or oil) or discovery of unidentified hazardous waste sites of contamination.

Mitigation

The potential for introducing hazardous waste through leaks or spills during construction, such as fuel spills from construction equipment, will be minimized by implementing good materials handling practices. BMPs will be used to prevent accidental release of hazardous materials during construction. Any accidental spills will be completely cleaned up according to state and federal requirements.

If previously unidentified sites are encountered during construction, all work in the area will stop immediately. UDOT will consult with DERR to determine the appropriate remediation measures.

3.17 VISUAL QUALITY

Regulatory Setting

Title 23 USC 109(h) requires that aesthetic values be considered during development of highway projects. FHWA Technical Advisory T6670.8A, *Guidance on Preparing and Processing Environmental and Section 4(f) Documents,* also includes consideration of visual impacts. In addition, SR-12 has been designated an All-American Road by FHWA. Therefore, Title 23 USC 162, also known as the National Scenic Byways Program, also applies. FHWA's May 18, 1995 interim policy provides criteria for the National Scenic Byways Program. A corridor management plan is required for All-American road designation. *The Scenic Byway 12 Corridor Management Plan* includes the following strategies for scenic resources:

- Recommend methods to preserve and protect visual quality along the byway corridor within existing ordinances.
- Encourage the enforcement of the existing regulations regarding removal of off-site signage.
- Encourage and work with local governments regarding the consolidation of business and service signage into single, standardized units.
- Work with the UDOT regarding the replacement of concrete Jersey barriers with retaining structures that are equally effective but more aesthetically appropriate.
- Work with federal, state, and local agencies to institute command and consistent design and color standards for signage, public rest areas and similar facilities, and interpretive exhibits and kiosks.
- Encourage the future development of industrial structures, such as cell phone towers, power lines, and telephone lines, to be designed to blend into the landscape.

Affected Environment

To receive All-American Road designation, a road must be considered a "destination unto itself" and must possess nationally significant qualities and have features that do not exist elsewhere. These features are described from west to east in the *Scenic Byway 12 Corridor Management Plan,* which reads:

> Once through the main street of Escalante, the byway heads toward the desert region where access to some of the most scenic backcountry experiences can be found … Traversing the Big Flat, Scenic Byway 12 opens into juniper and sage country where one may see the culture of the Old West. Cattlemen drive herds of cattle through this rugged area … From Head of the Rocks, the slickrock country is exposed in a dramatic fashion. Here the views stretch across the layers of slickrock all the way to the Henry, Fiftymile and Navajo Mountains, while capturing the labyrinth of canyon rims that twist and turn through the Escalante River drainage. Heading north to the town of Boulder, the road crosses the Escalante River, borders the beautiful Calf Creek Recreation Area, and climbs in elevation through the majestic magenta Navajo sandstone to the Hogsback. This part of the highway is on top of a rim with waves of slickrock dropping off dramatically on either side of the pavement … Cresting the hill to the pastoral setting of Boulder, with its rolling green fields and gurgling creeks, Scenic Byway 12 winds into this unique rural town.

In the SR-12 corridor, many existing visual elements impact both the view *from* the roadway (e.g., power lines) and views *toward* the roadway (e.g., use of unnatural materials, such as Jersey barriers or fill material that is not similar in color and does not have a similar origin to surrounding natural materials).

Impacts

No-Build Alternative

The No-Build Alternative would not result in new direct impacts on the current visual resources of the corridor. However, visual resources would be indirectly impacted negatively. No existing visual impacts, such as concrete Jersey barriers, would be remedied. Without right-of-way transfer, routine maintenance of drainage facilities would continue to be difficult. Erosion resulting from storm runoff not flowing as intended would continue to create rills and channels on the embankment. Without a right-of-way transfer for a stockpile site, imported fill material that does not blend with local rock and soil would continue to be used for maintenance purposes.

Build Alternative

The Build Alternative would result in both positive and negative direct impacts to visual resources. Positive impacts include the following:

- In areas where the roadside is stabilized (MP 75.4 and MP 77.5 to MP 77.7 and at MP 75.4 if Option 1—Rock Removal is chosen), the existing concrete Jersey barriers would be replaced with aesthetic barriers. These aesthetic barriers would improve visual resources because they would blend in with the native rock better and be less visible from the hiking trails below the road. Additionally, they may be lower than the existing barriers in some locations and could offer better views of the canyons below from the road. While existing barriers are 36-inches high, the new barriers would be between 18-inches and 36-inches high. The barrier height will be evaluated during the design phase. Additionally, the roadway would be shifted to the east away from Calf Creek, making the road and traffic less visible.
- Large boulders placed at the southwest abutment of Calf Creek Bridge as scour protection would not be necessary in the realigned channel. These boulders do not fit in with the rest of the channel.
- Future maintenance activities would have more access to visually consistent materials. The additional right-of-way would allow UDOT to stockpile rock and soil from the corridor that is derived from rock falls and road maintenance or construction activities; this collected material would then be used as fill when needed. The use of fill material from the corridor would look more natural and blend better with the visual environment than using fill materials imported from out of the area.

Negative impacts include the following:

- In areas where rock removal is required, the height of the rock face would increase. Most of the rock removal would occur in areas that have previously been blasted; however, there may be some sections that have not been previously blasted.

Impacts that are subjective and may be considered as positive or negative include the following:

- With replacement of Calf Creek Bridge, the existing wooden parapet would be replaced with an aesthetic barrier. The existing wooden parapet is mounted on a low curb (approximately 4 inches high) and blocks little of the view of Calf Creek. The aesthetic barrier would be between 18 and 36 inches high and would block more of the view of Calf Creek.
- If Option 2—Retaining Wall is chosen for stabilization at MP 75.4, a retaining wall would be visible from the Calf Creek Recreation Area. The wall would be approximately five to ten feet tall and 400 feet long. A visual simulation of this option is shown on Graphic 2.5. Although the wall would be higher than the existing concrete Jersey barrier, it would be constructed with aesthetic materials that would blend into the environment. Option 2 could potentially be considered an improvement over the existing condition; however, this option results in greater long-term visual impacts than Option 1—Rock Removal.

Temporary Construction Impacts

The Build Alternative would result in the following short-term impacts to visual resources:

- Freshly exposed rock faces would appear less weathered than the surrounding rock faces for a few years.
- Soils disturbed by construction would stand out from the surrounding area.

Short-term visual impacts would be created during construction at locations where excavation occurs. The duration of these visual impacts would be controlled to the extent possible by construction scheduling and effective relandscaping and revegetation programs.

Mitigation

UDOT is incorporating the CSS philosophy into the SR-12, Escalante to Boulder, project and is striving to find a solution that protects and enhances the environmental setting, has a minimal impact on natural resources, and is aesthetically appropriate. Mitigation measures for impacts to visual resources include the following:

- In areas where existing barriers need to be stabilized and on the Calf Creek Bridge, aesthetic barriers will be used instead of concrete Jersey barriers. If it is determined during design to be safe, 18-inch high barriers will be used instead of 36-inch high barriers to improve views from the road.
- Efforts will be made to match form, line, color, and texture. If possible, source material matching the surrounding area will be used.
- Short-term scarring impacts from blasting will be minimized by softening or removing evidence of blast holes, excavator scrape marks, and loose material.
- Products that speed the progress of desert varnish will be used on freshly exposed rock to blend in with nearby rock faces.
- Slope rounding will be included in final grading to blend new soil cuts into the existing grade.
- Existing vegetation will be protected by preventing disturbance beyond specified construction limits.
- Disturbed slopes will be stabilized and revegetated with a native seed mix.

3.18 CUMULATIVE EFFECTS

Cumulative effects focus on the long-term effects on a specific resource as opposed to a specific action. Cumulative impacts are defined by the Council on Environmental Quality (CEQ) in 40 CFR 1508.7 as follows:

> "Cumulative impact" is the impact on the environment [that] results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time.

The resources of concern for this analysis are those that would have direct long-term impacts from the proposed Build Alternative:

- Geology and Soils (Cryptobiotic Soil Crusts)
- Water Resources and Wetlands
- Cultural Resources
- Visual Resources

The geographic boundaries of the analysis are defined independently for each resource. For cryptobiotic soil crusts and cultural resources, the study area is the Grand Staircase-Escalante National Monument. For water resources and wetlands, the study area is the Calf Creek watershed. For visual resources, the study area includes the viewshed from the road and areas from which the road can be seen. By convention, the general temporal boundaries are 30 years before this project was proposed (approximately 1975) to the project design year, 2030.

Past Actions

The following actions occurred in the past and could potentially contribute to cumulative impacts:

- Widening of SR-12 (1975).
- Realignment of SR-12 above the Calf Creek Recreation Area (1977).
- Realignment of sharp turn north of the Calf Creek Recreation Area at approximately MP 75.6 (1983).
- Designation of WSAs (1991).
- Replacement of the Escalante River Bridge (1994).
- Revision of livestock grazing regulations (1995).
- Creation of the Grand Staircase-Escalante National Monument (1996). The state and federal government negotiated a land exchange that transferred 180,000 acres of state land within the monument to federal ownership. A management plan was developed to protect and manage resources within the 1,870,800-acre monument.
- Retirement of Willow Gulch grazing allotment at Calf Creek (2004).

Present and Reasonably Foreseeable Future Actions

Reasonably foreseeable projects are either funded or part of a master plan that has been approved by the agency responsible for implementation. The following current or planned projects are on

the Statewide Transportation Improvement Program (STIP) along SR-12 between Escalante and Boulder and could potentially contribute to cumulative impacts:

- *Scenic Byway 12 Signage and Interpretive Master Plan*. Improvements to existing sites and construction of new interpretive sites (e.g., trailheads, waysides, overlooks, etc.) are planned along SR-12 between Panguitch and Torrey. Between Escalante and Boulder, improvements are planned at the following locations:
    - Hole-in-the-Rock Wayside—MP 64.3: Move wayside west in conjunction with intersection improvements.
    - Head-of-the-Rocks Wayside—MP: 69.3: Improve parking, viewing area, interpretative panels.
    - Boynton Overlook Wayside—MP 73: Two options are under consideration, either minimal improvement or expansion to day-use area.
    - Escalante River Trailhead—MP 73.9: Provide toilet and redesign parking.
    - Calf Creek Recreation Area and Trailhead—MP 75.0: Minor improvements.
    - Hogsback Wayside—MP 79.0: Remove interpretive panel and discourage parking.
    - Hogsback Day Use Area—MP 80.3: Construct day-use area with interpretive trail, picnic tables, and toilets.
    - Hell's Backbone Wayside—MP 83.3: Construct wayside with interpretive panel.
- Design of the Escalante Heritage Visitor Center on the east side of Escalante that will chronicle the story of the "Hole-in-the-Rock" pioneers. This improvement is outside of the monument.

In addition to the projects listed above, the following current or planned projects are on the STIP within the monument but outside the corridor between Escalante and Boulder and could potentially contribute to cumulative impacts:

- *Scenic Byway 12 Signage and Interpretive Master Plan*. Improvements to existing or construction of new interpretive sites (not between Escalante and Boulder).
- Pavement reconstruction of Hole-in-the-Rock Road in Kane County.
- Pavement rehabilitation and embankment armoring at the Paria River Bridge on Kodachrome Road.

The following current or planned projects are listed as reasonably foreseeable (over a 15-year planning period) in the *Grand Staircase-Escalante National Monument Management Plan* and could potentially contribute to cumulative impacts:

- Development of recreation sites and primitive areas
- Development of communication sites
- Development of utility and road rights-of-way
- Water developments
- Vegetation restoration activities

Cumulative Impacts by Resource

Geology and Soils (Cryptobiotic Soil Crusts)

For the cryptobiotic soil crust analysis, the geographic extent is the Grand Staircase-Escalante National Monument. This extent was selected because all of the proposed improvements are

within the monument and because the entire area is managed by BLM under the monument's management plan.

Cryptobiotic crusts are negatively impacted by surface disturbance. Past construction projects, including those listed in the past actions discussion above, could have resulted in negative impacts to cryptobiotic crusts. In 1975, land ownership throughout the area—with the exception of private lands concentrated in and around towns—was a "checkerboard" of state and federal lands that were generally managed as open range with few restrictions on off-road vehicle travel. Since 1975, the overall acreage of disturbed cryptobiotic soil crusts in the area has been reduced due to the prohibition of off-road vehicle use throughout the monument, which removed 1,087 miles of off-road vehicle routes from service. The potential for surface disturbance was also decreased with the designation of 880,857 acres of WSAs within the monument in the 1990s.

The Build Alternative would result in some loss of cryptobiotic soil crusts in areas where the footprint of the road is expanding and would result in disturbance of these soil crusts in construction areas and areas that support future maintenance within the right-of-way. Surface disturbance resulting from maintenance is difficult to estimate and has not been quantified. Proposed spot improvements at 14 locations would result in approximately 11.5 acres of permanent disturbance because of roadway widening and 6.5 acres of temporary disturbance because of construction activities. This area includes impacts to sandstone as well as soils. Therefore, the permanent impacts to cryptobiotic soil crusts would be less than 14 acres.

Other planned projects, outlined in the *Scenic Byway 12 Signage and Interpretive Master Plan*, would also impact some of the soil crusts along SR-12 in areas where waysides are being expanded or improved. Additionally, the monument's management plan lists the following activities that could impact cryptobiotic soil crusts:

- Commercial filming
- Communication sites, utility rights-of-way, and road rights-of-way
- Inventory, monitoring, and research activities
- Livestock grazing
- Recreational facilities and use
- Transportation
- Vegetation and weed management
- Water development
- Wildfire management

The management plan estimated the potential for cumulative surface disturbance over a 15-year planning horizon. Reasonably foreseeable activities like recreation facilities, rights-of-way, and water developments could disturb approximately 360 acres. However, much of this would occur in areas previously disturbed. Vegetation restoration could potentially cause surface disturbance to an additional 20,000 acres; much of this would occur in areas already disturbed. Disturbance from visitors and livestock is difficult to estimate and was not quantified in the management plan.

The monument's management plan includes restrictions on surface disturbing activities and controls on visitor and vehicle use. The plan offers increased protection to cryptobiotic soil crusts and lists increased research on restoration ecology and biological soil crusts as potential methods

to restore disturbed areas and mitigate impacts to this resource. WSA designation prevents surface disturbance on 880,857 acres within the monument.

In summary, impacts to cryptobiotic crusts are anticipated to be managed by protection measures from WSAs and mitigation measures included in the monument's management plan. The Build Alternative would result in impacts to cryptobiotic soil that are orders of magnitude less than other current and reasonably foreseeable actions. When combined with all impacts from other past and reasonably foreseeable future actions, the Build Alternative would not jeopardize this monument resource.

Water Resources and Wetlands

The geographic extent selected for cumulative impacts to water resources and wetlands is the Calf Creek watershed where these two resources are connected. Water resources and wetlands are considered together because impacts from the proposed Build Alternative to both resources are concentrated in this watershed.

The Build Alternative would not result in direct long-term impacts to the following:

- Escalante River
- Alvey Wash
- Boulder Creek
- Groundwater resources (e.g., private groundwater wells or water rights)
- Public drinking water sources

Water resources and wetlands can be impacted by the following:

- Increases in impervious area, which results in higher peak flows and increased pollutant loading
- Surface disturbance and erosion, which results in sediment laden runoff flowing into these resources
- Placement of fill in wetlands
- Trampling or compaction of wetlands

In 1975, the Calf Creek watershed was very similar to the watershed today. The following past actions could contribute to cumulative impacts to water resources and wetlands:

- Widening of SR-12 in 1975 resulted in an increase in impervious surface area discharging to Calf Creek and potentially in the placement of fill in wetlands adjacent to SR-12. Numerical information on impacts (e.g., additional acres of pavement or acres of wetlands filled) is not readily available.
- Realignment of short sections of SR-12 in 1977 and again 1983 resulted in moving the current road farther away from Calf Creek than it was in 1975 and potentially increasing the surface area. Therefore, stormwater runoff travels farther overland before reaching Calf Creek. This additional distance provides greater opportunity for water quality treatment through infiltration and absorption prior to discharge into Calf Creek.
- Designation of WSAs in 1991 resulted in protection from future development and surface disturbance. The majority of the Calf Creek watershed is within the Phipps-Death Hollow WSA.

- Retirement of the Willow Gulch grazing allotment along Calf Creek in 2004 resulted in the termination of livestock grazing along the creek. This provides improvements to water quality through decreased erosion and sediment loading as well as protection of riparian and wetland areas from compaction and trampling.
- Creation of the Grand Staircase-Escalante National Monument in 1996 resulted in protection of Calf Creek through prohibition of facilities in riparian areas, restrictions on surface disturbing activities, closure of vehicular travel off designated routes, and monitoring, restoration, and revegetation provisions.
- *Wild and Scenic River Suitability Study/Recommendation for the Escalante River Drainage*, completed in 1999, resulted in a recommendation for protection of Calf Creek for recreational values.

The Build Alternative would result in increasing the impervious (e.g., paved) surface at six locations in the Calf Creek watershed. These locations are mainly concentrated at the lower end of the watershed around the Calf Creek Recreation Area and bridge. The sum of these six spot improvements would increase the impervious area by approximately 1.1 acres, which would result in a 1.2 cfs increase in surface runoff during a ten-year storm. This small amount of runoff over the area under consideration adds to additional runoff from previously developed surfaces over the past 30 years, including the widening of SR-12.

Under the *Scenic Byway 12 Signage and Interpretive Master Plan*, BLM would also create some additional impervious surface with construction of the Hogsback Day Use Area. These improvements are relatively small and would result in additional small increases in surface runoff. The planned Hogsback Day Use Area is in the upper section of the Calf Creek Watershed, roughly five miles upstream from most of the spot improvements in the Build Alternative. In shorter duration or higher intensity storm events, the peak flow from the Build Alternative would enter Calf Creek before the peak from the planned Hogsback Day Use Area. In other words, these two small incremental increases in surface runoff would not impact Calf Creek at the same time and create an additive peak. No other future projects that would impact surface runoff in the Calf Creek watershed are planned or foreseeable, thereby adding to the cumulative impacts described above.

Under the Build Alternative, approximately 0.05 acres of wet meadow wetlands would be permanently lost under the expanded roadway footprint. Another 0.05 acres of wet meadow wetlands will be relocated from the future Calf Creek river channel location to the current Calf Creek river channel location. The value of the moved wetlands will be re-created at the new location through both design and careful conservation and the reuse of the existing topsoil with its existing seed mix and microbiologic features. Therefore, for long-term cumulative impact considerations, the Build Alternative would result in a 0.05-acre loss of wetlands. No other current or planned projects would result in impacts to wetlands in the Calf Creek watershed.

The Calf Creek watershed benefits from several different protection measures. The Grand Staircase-Escalante National Monument's management plan provides for the protection of water resources and wetlands through prohibition of facilities in riparian areas, mechanisms to control visitor use, closure of vehicular travel off of designated routes, and monitoring, restoration, and revegetation programs. The majority of the watershed is within a WSA, which provides protection for water resources and wetlands through prohibition of surface disturbance.

Suitability for designation as a wild and scenic river also provides protection through prohibition of activities such as damming or diversions.

In summary, the Build Alternative would result in a minor increase in impervious surface area and a minor loss of wetlands. Impacts from present and reasonably foreseeable future actions will be managed by protection measures in the monument's management plan, WSAs, and wild and scenic suitability designation.

Cultural

For the cultural analysis, the geographic extent is the Grand Staircase-Escalante National Monument. This extent was selected because all of the proposed improvements are within the monument and because the entire area is managed by BLM under the monument's management plan.

Cultural resources can be negatively impacted by construction and surface disturbance. Past construction projects, including those listed in the past actions discussion above, could have resulted in negative impacts to cultural resources. Overall, there has been relatively little construction in the area since 1975. The overall acreage of disturbed areas has been reduced by prohibiting off-road vehicle use throughout the monument, which removed 1,087 miles of off-road vehicle routes from service. The potential for surface disturbance was also decreased with the designation of 880,857 acres of WSAs within the monument in the 1990s.

The Build Alternative would impact Site 42Ga6091, which is eligible for the NRHP under Criteria A and C. This site includes 12 features that are remnants of the old road between Escalante and Boulder constructed by the CCC. The Build Alternative would remove 55 to 60 feet of ditch, roughly ten percent of the length of ditch inventoried. The Build Alternative would also impact 57,745 square feet (1.3 acres) of Site 42Ga5647. This site is a large, dispersed lithic scatter located along the east and west sides of SR-12 at the southern end of New Home Bench. The Build Alternative would impact approximately five percent of the 24-acre site.

Under the *Scenic Byway 12 Signage and Interpretive Master Plan*, BLM would also impact Site 42Ga5647 with construction of the Hogsback Day Use Area and would add to the 1.3-acre impact from the Build Alternative. Site 42Ga5647 is eligible for the NRHP under Criterion D because it is likely to yield information important to the prehistory of the area. Impacts from both of these actions will be mitigated according to the MOA between FHWA, the Grand Staircase-Escalante National Monument, and SHPO. A copy of the MOA is available in Appendix A.

Other planned projects, outlined in the *Scenic Byway 12 Signage and Interpretive Master Plan*, could impact cultural resources along SR-12 in areas where waysides are being expanded or improved. Additionally, the management plan lists the following activities that could impact cultural resources:

- Unauthorized collection
- Commercial filming
- Communication sites, utility rights-of-way, and road rights-of-way
- Inventory, monitoring, research activities
- Livestock grazing
- Recreational facilities and use
- Transportation
- Vegetation and weed management

- Water development
- Wildfire management

In the management plan, BLM estimates that the total surface disturbance associated with new or expanded recreation facilities throughout the entire monument would be 360 acres, much of which has already been disturbed and likely represents no new impacts to cultural resources. BLM also estimates that approximately 20,000 acres within the monument would be disturbed by planned revegetation efforts. In addition to these planned projects, growth of the recreation use in the area would result in increased surface disturbances and, as a consequence, increased impacts on cultural resources. The magnitude of these impacts is not possible to estimate.

The management plan offers protection to cultural resources through restrictions on surface disturbing activities, controls on visitor use, closure of vehicular travel off of designated routes, avoidance when placing facilities, and visitor education. WSA designation prevents surface disturbance on 880,857 acres within the monument. These measures would offset most of the impacts to cultural resources. In areas where impacts could not be avoided, they would be mitigated through excavation and curation.

Considering protection measures from WSAs and mitigation measures included in the management plan, cultural resources are not in jeopardy within the monument. The Build Alternative would result in minor impacts to cultural resources, which will be mitigated through data recovery. When combined with all impacts from other actions, the Build Alternative would not jeopardize cultural resources in the monument.

Visual Resources

For visual resources analysis, the geographic extent includes the viewshed from the road and areas from which the road can be seen. Visual resources can be negatively impacted by construction or disturbance that does not retain the existing character of the landscape—for example, changes in form, line, color, and texture that attract the attention of the casual observer.

Past construction projects, including those listed in the past actions discussion above could have resulted in negative impacts to cultural resources. Overall, there has been little construction in the area since 1975. Construction on SR-12 includes widening, realignment of two sections near the Calf Creek Recreation Area, and replacement of the Escalante River Bridge. All of these contribute to impacts of viewsheds from the road or toward the road. Construction visible from SR-12 since 1975 is limited and concentrated around Escalante and Boulder.

The Build Alternative would have the following long-term visual impacts on views from or toward the road:

- Construction, including rock removal, would take place along approximately 2,600-linear feet of the road at four locations. The actual length of rock removal would be slightly less because the rock face is far enough away from the road for short sections that it could be left in place. At these locations, the height of the rock face would increase. Most of the rock removal would occur in areas that have previously been blasted; however, there may be some sections that have not been previously blasted.
- Approximately 1,100 to 1,400 linear feet of concrete Jersey barrier would be replaced with an aesthetic barrier.

- Approximately 1,000-linear feet of new aesthetic barrier would be placed at the Calf Creek Bridge.
- A 400-foot long aesthetic retaining wall could potentially be constructed.
- Large boulders that do not blend in with the natural channel from Calf Creek would be removed.
- Local material would be used for future maintenance activities that would look more natural and blend better with the visual environment.

Other planned projects, outlined in the *Scenic Byway 12 Signage and Interpretive Master Plan*, could impact visual resources along SR-12 in areas where waysides are being expanded or improved. These projects are designed to enhance the Scenic Byway experience for travelers by providing interpretive information and areas to enjoy the views. The monument's management plan offers protection of the view shed through restrictions on surface disturbing activities. WSA designation also offers protection of the viewshed for approximately 35 percent of the length between Escalante and Boulder. Impacts on the view from SR-12 due to residential and commercial development on private land in Escalante and Boulder are reasonably foreseeable.

Impacts from the Build Alternative are anticipated to be mitigated using visually consistent materials for construction and maintenance. Impacts on the viewshed from SR-12 are anticipated to be managed by protection measures in the management plan and WSA designation. Cumulative impacts to visual resources are anticipated to be minor and would not likely change the characteristics that qualify SR-12 for designation as a Scenic Byway and All-American Road.

NO.	MILE POST	IMPROVEMENT	FIGURE
		PROPOSED RIGHT OF WAY	
1	68.9 to 83.1	SR-12 Corridor	2.2, sheet 1 to 4
1a	82.1	Stockpile Site	2.2, sheet 4
		PROPOSED SPOT IMPROVEMENTS	
2	74.5	Replace Calf Creek Bridge	2.3
3		STABILIZE ROADWAY AND ROADSIDE	
3a	74.8	Stabilize Roadway	2.4, 2.4-A
3b	75.4	Stabilize Roadside	2.5 to 2.6-A
3c	77.5 to 77.7	Stabilize Roadside	2.7, 2.7-A
4		PROVIDE SLOW VEHICLE TURNOUTS	
4a	69.9	Westbound	2.8, 2.8-A
4b	71.7	Eastbound	2.9, 2.9-A
4c	72.5	Westbound	2.10, 2.10-A
4d	76.2	Eastbound	2.11, 2.11-A
4e	79.5	Eastbound	2.12, 2.12-A
4f	83	Westbound	2.13, 2.13-A
5		IMPROVE INTERSECTIONS	
5a	64.4	Hole-in-the-Rock Road	2.14, 2.14-A
5b	75	Calf Creek Recreation Area	2.15, 2.15-A
6	71	Widen Narrow Curve	2.16, 2.16-A
7	*	Improve Signing	

* (locations to be determined during design so these are not depicted on the map)

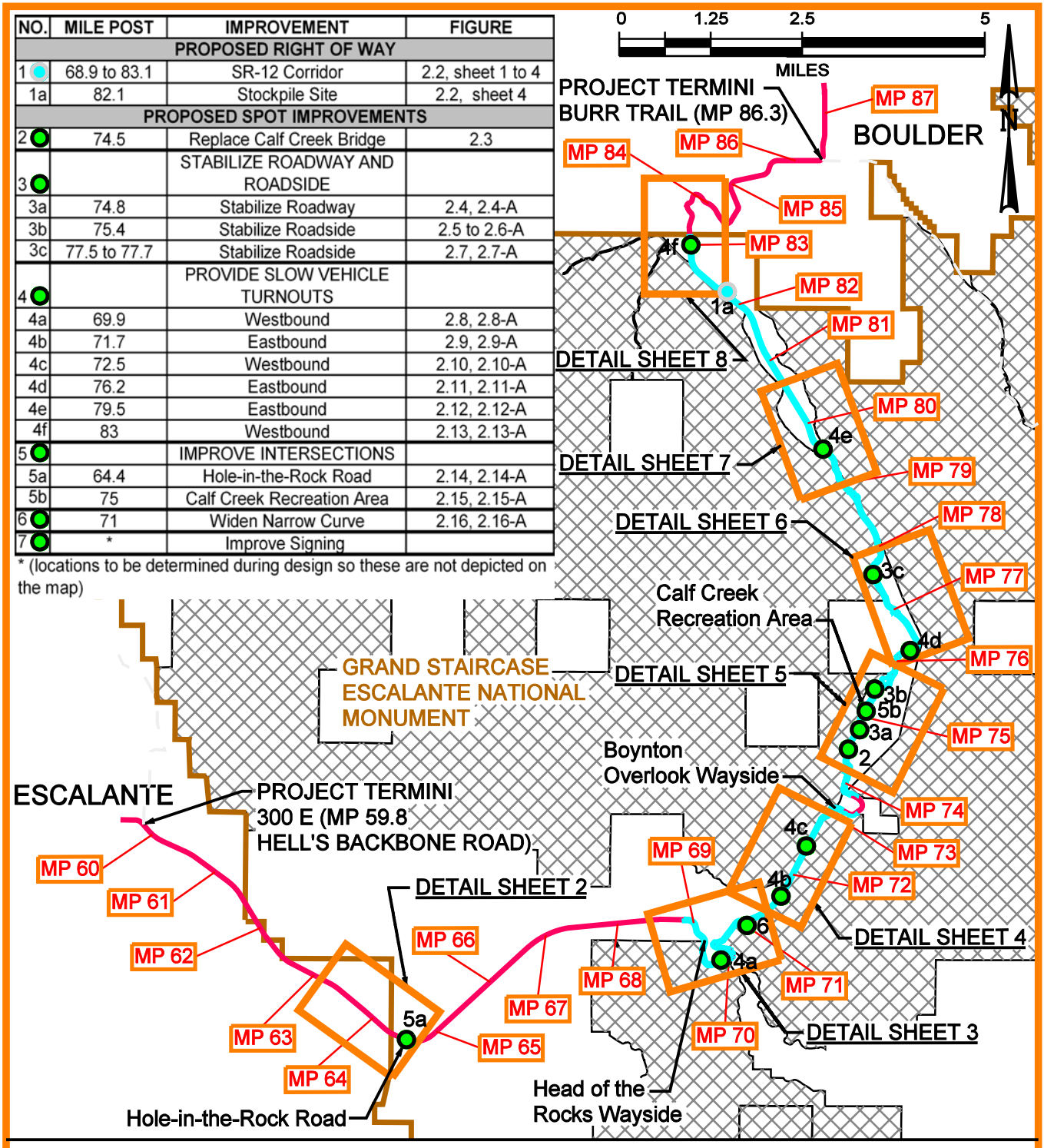
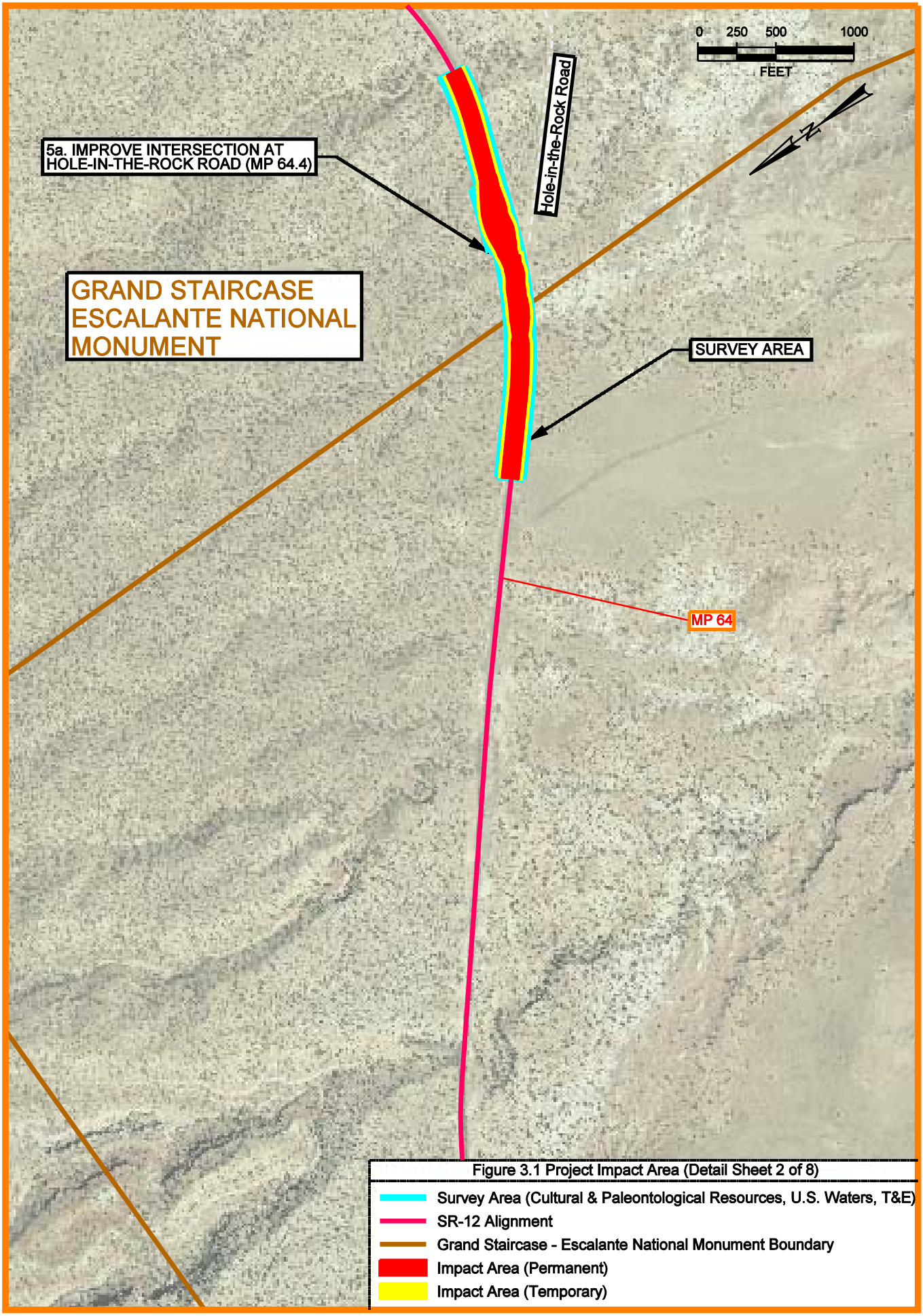
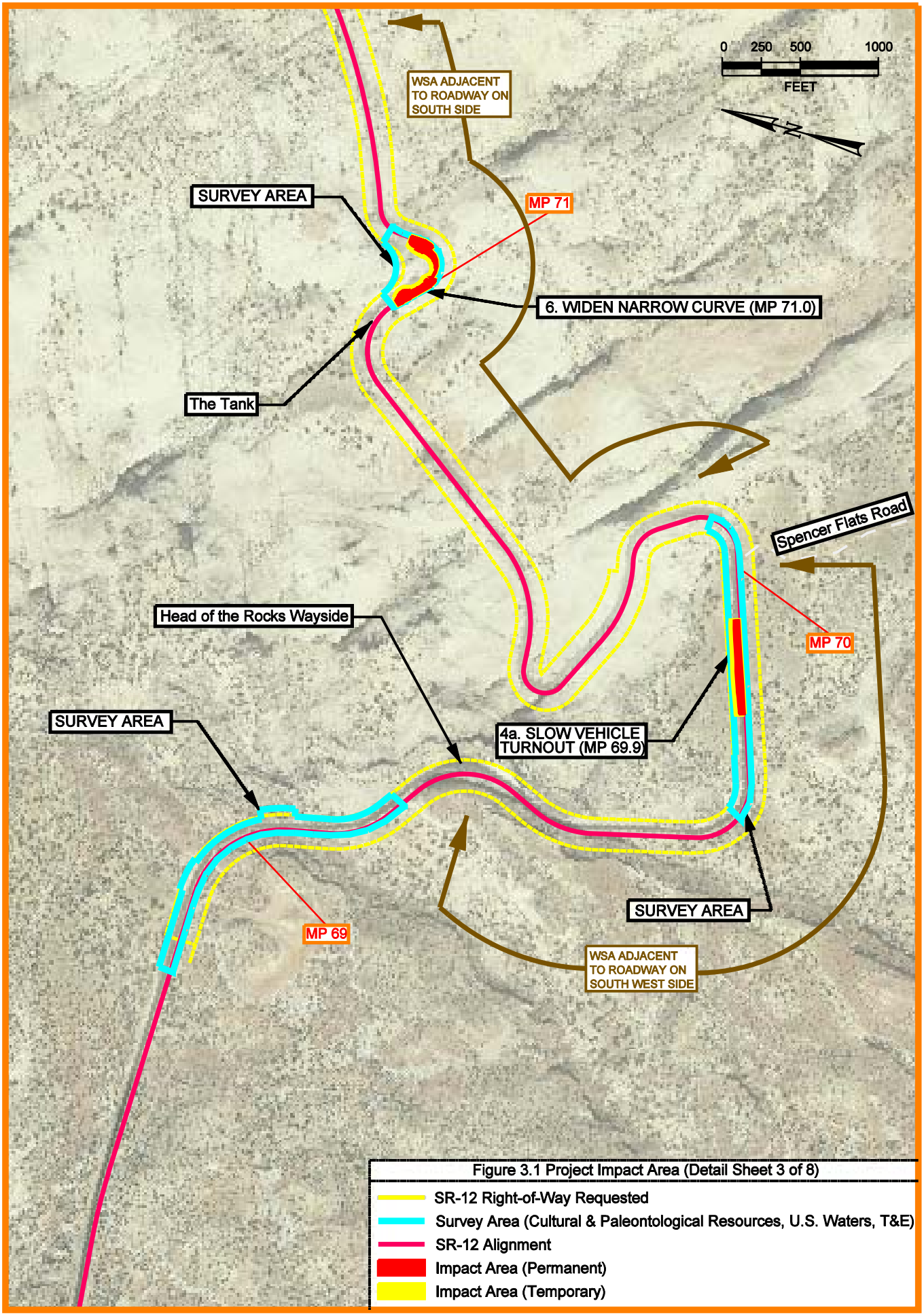


FIGURE 3.1 PROJECT IMPACT AREA

- SR-12 Existing Right-of-Way
- SR-12 Right-of-Way Requested
- #: Additional Right-of-Way Requested for Stockpile Site
- #: Location of Proposed Spot Improvement
- Detail Sheets (See Sheets 2 - 8)
- Wilderness Study Area (WSA) (Boundary is Approximate)
- Grand Staircase - Escalante National Monument Boundary


0 250 500 1000
FEET
N
5a. IMPROVE INTERSECTION AT HOLE-IN-THE-ROCK ROAD (MP 64.4)
Hole-in-the-Rock Road
GRAND STAIRCASE ESCALANTE NATIONAL MONUMENT
SURVEY AREA
MP 64
Figure 3.1 Project Impact Area (Detail Sheet 2 of 8)
Survey Area (Cultural & Paleontological Resources, U.S. Waters, T&E)
SR-12 Alignment
Grand Staircase - Escalante National Monument Boundary
Impact Area (Permanent)
Impact Area (Temporary)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WSA ADJACENT TO ROADWAY ON SOUTH SIDE
SURVEY AREA
MP 71
6. WIDEN NARROW CURVE (MP 71.0)
The Tank
Spencer Flats Road
MP 70
Head of the Rocks Wayside
SURVEY AREA
4a. SLOW VEHICLE TURNOUT (MP 69.9)
MP 69
SURVEY AREA
WSA ADJACENT TO ROADWAY ON SOUTH WEST SIDE
Figure 3.1 Project Impact Area (Detail Sheet 3 of 8)
SR-12 Right-of-Way Requested
Survey Area (Cultural & Paleontological Resources, U.S. Waters, T&E)
SR-12 Alignment
Impact Area (Permanent)
Impact Area (Temporary)

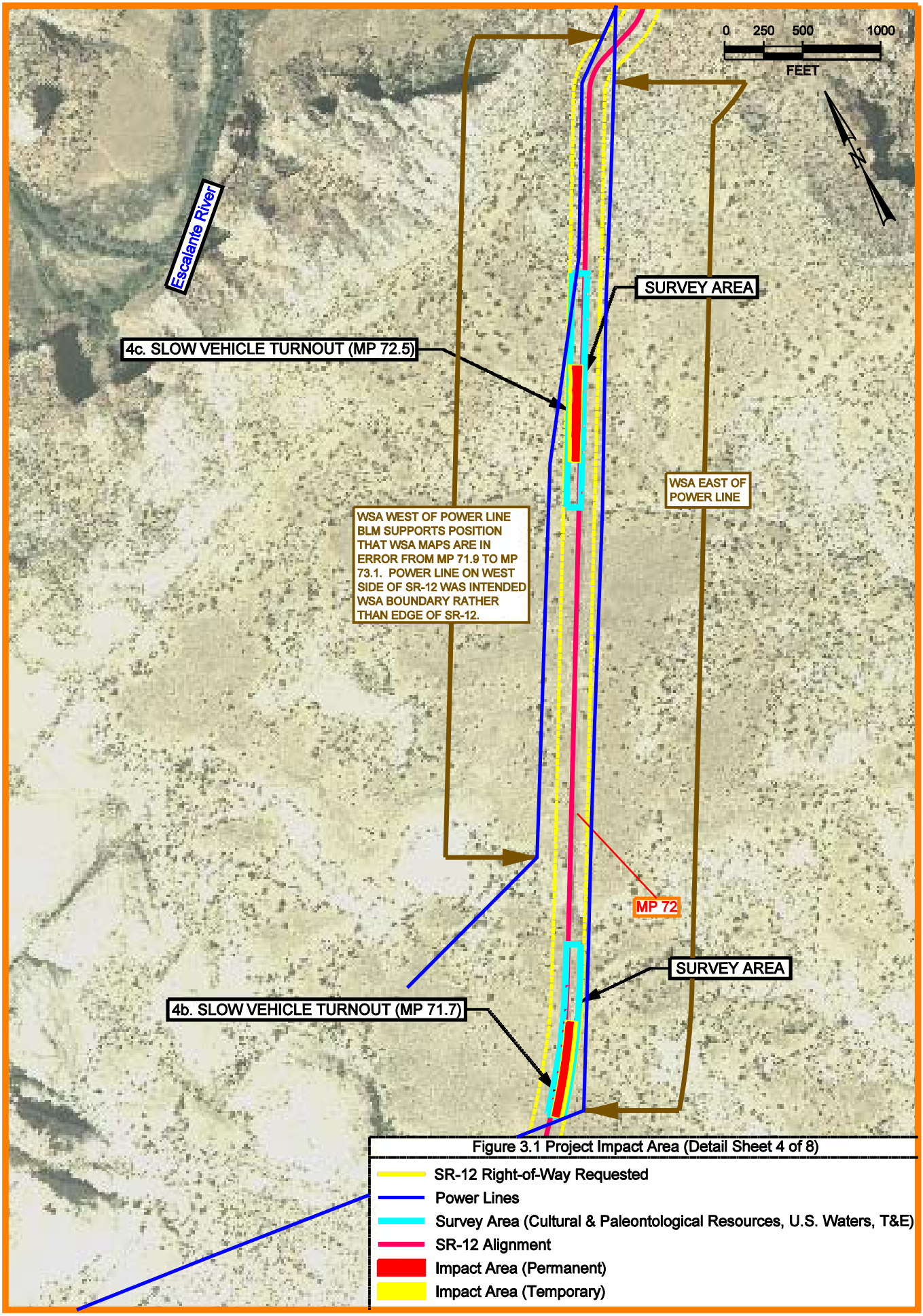
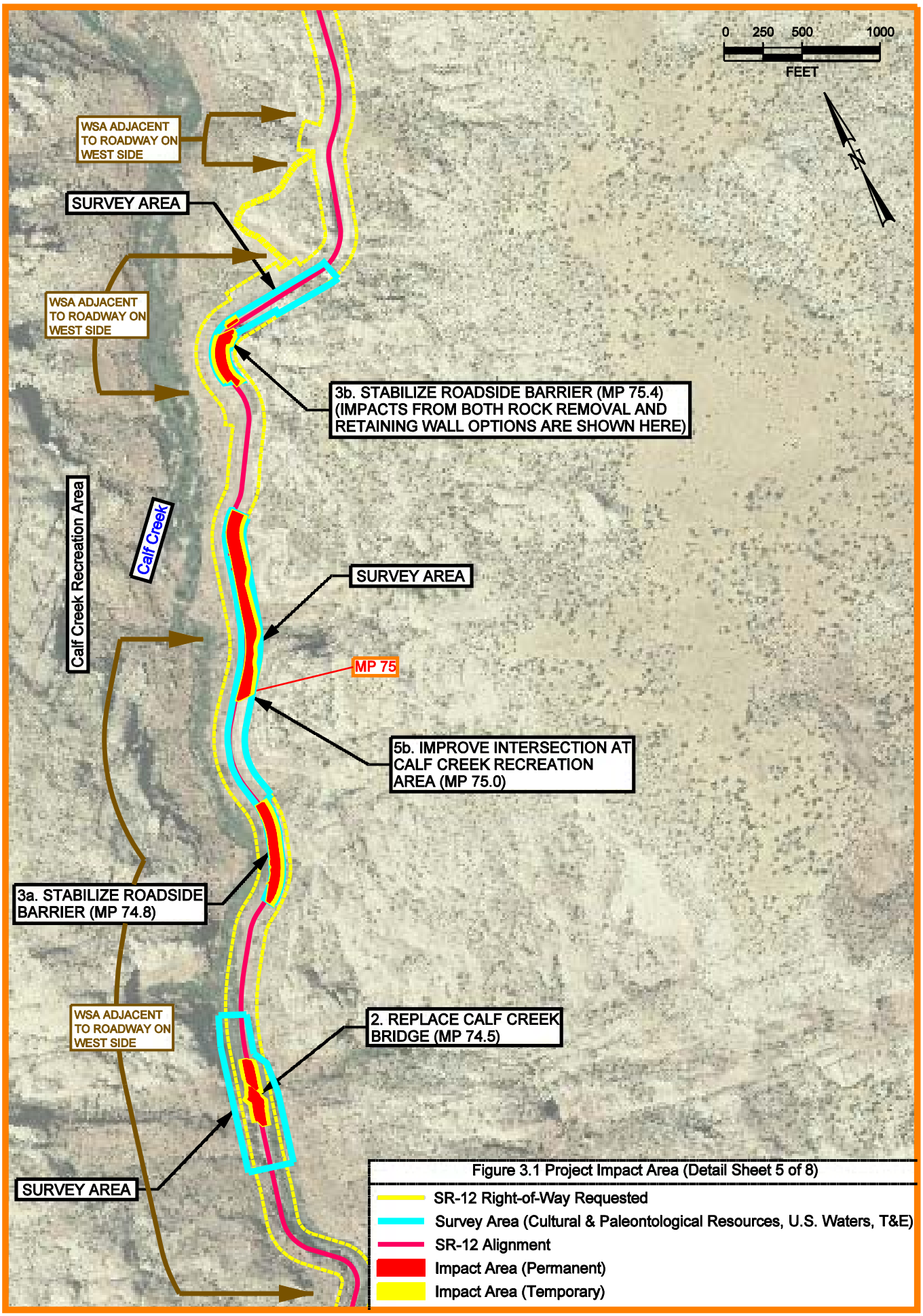


Figure 3.1 Project Impact Area (Detail Sheet 4 of 8)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FEET
WSA ADJACENT TO ROADWAY ON WEST SIDE
SURVEY AREA
WSA ADJACENT TO ROADWAY ON WEST SIDE
3b. STABILIZE ROADSIDE BARRIER (MP 75.4) (IMPACTS FROM BOTH ROCK REMOVAL AND RETAINING WALL OPTIONS ARE SHOWN HERE)
Calf Creek Recreation Area
Calf Creek
SURVEY AREA
MP 75
5b. IMPROVE INTERSECTION AT CALF CREEK RECREATION AREA (MP 75.0)
3a. STABILIZE ROADSIDE BARRIER (MP 74.8)
WSA ADJACENT TO ROADWAY ON WEST SIDE
2. REPLACE CALF CREEK BRIDGE (MP 74.5)
SURVEY AREA
Figure 3.1 Project Impact Area (Detail Sheet 5 of 8)
SR-12 Right-of-Way Requested
Survey Area (Cultural & Paleontological Resources, U.S. Waters, T&E)
SR-12 Alignment
Impact Area (Permanent)
Impact Area (Temporary)

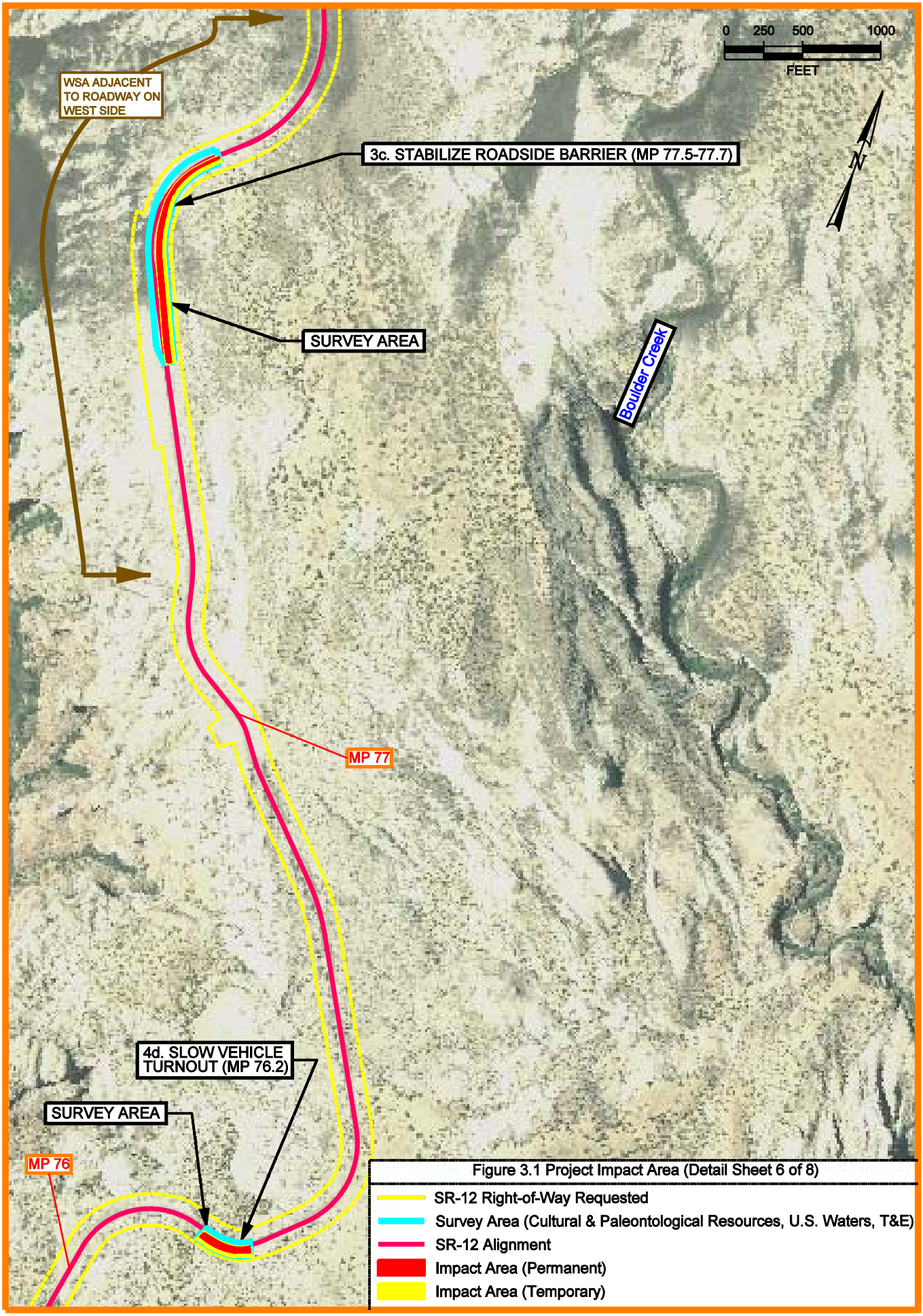


Figure 3.1 Project Impact Area (Detail Sheet 6 of 8)

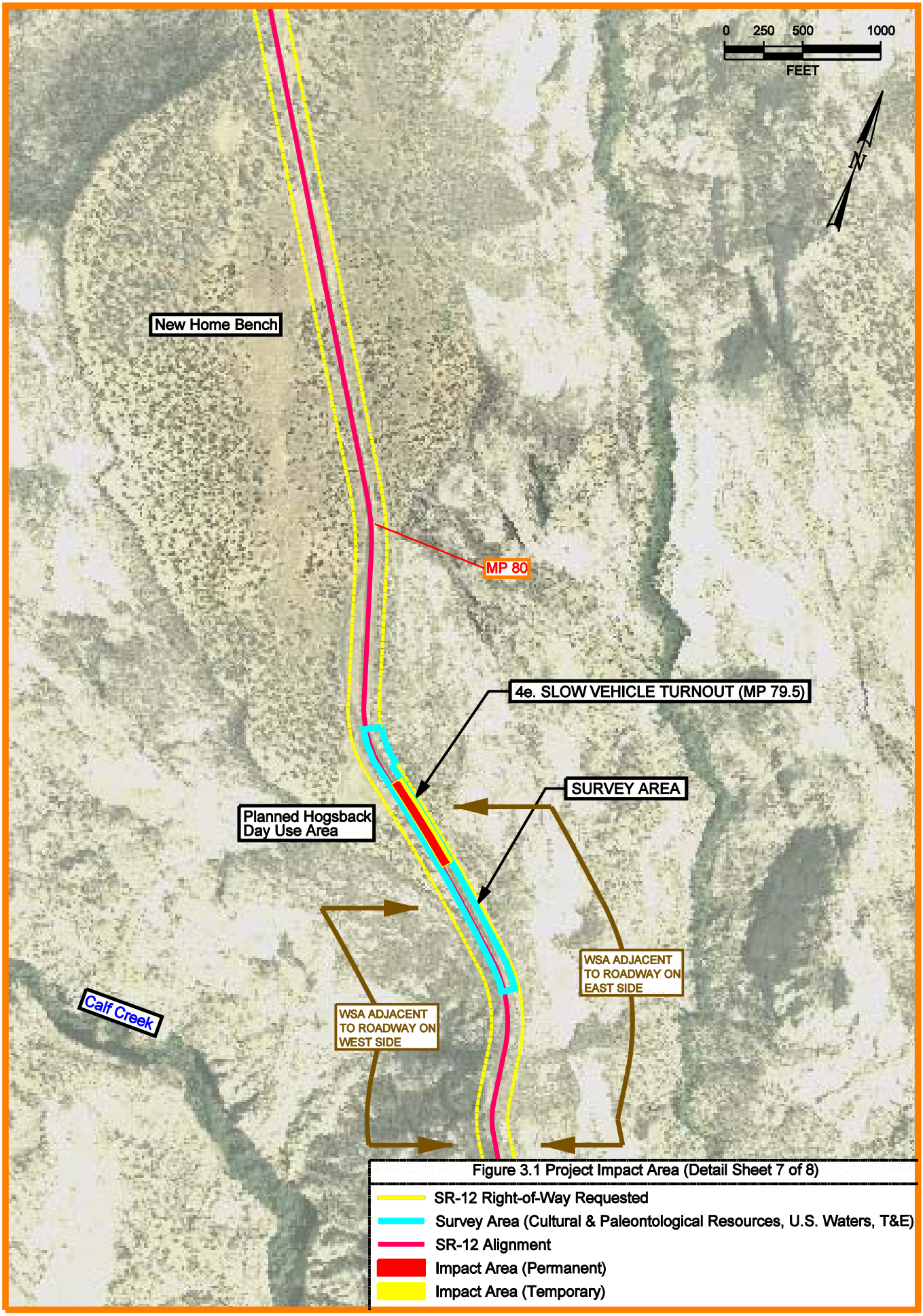
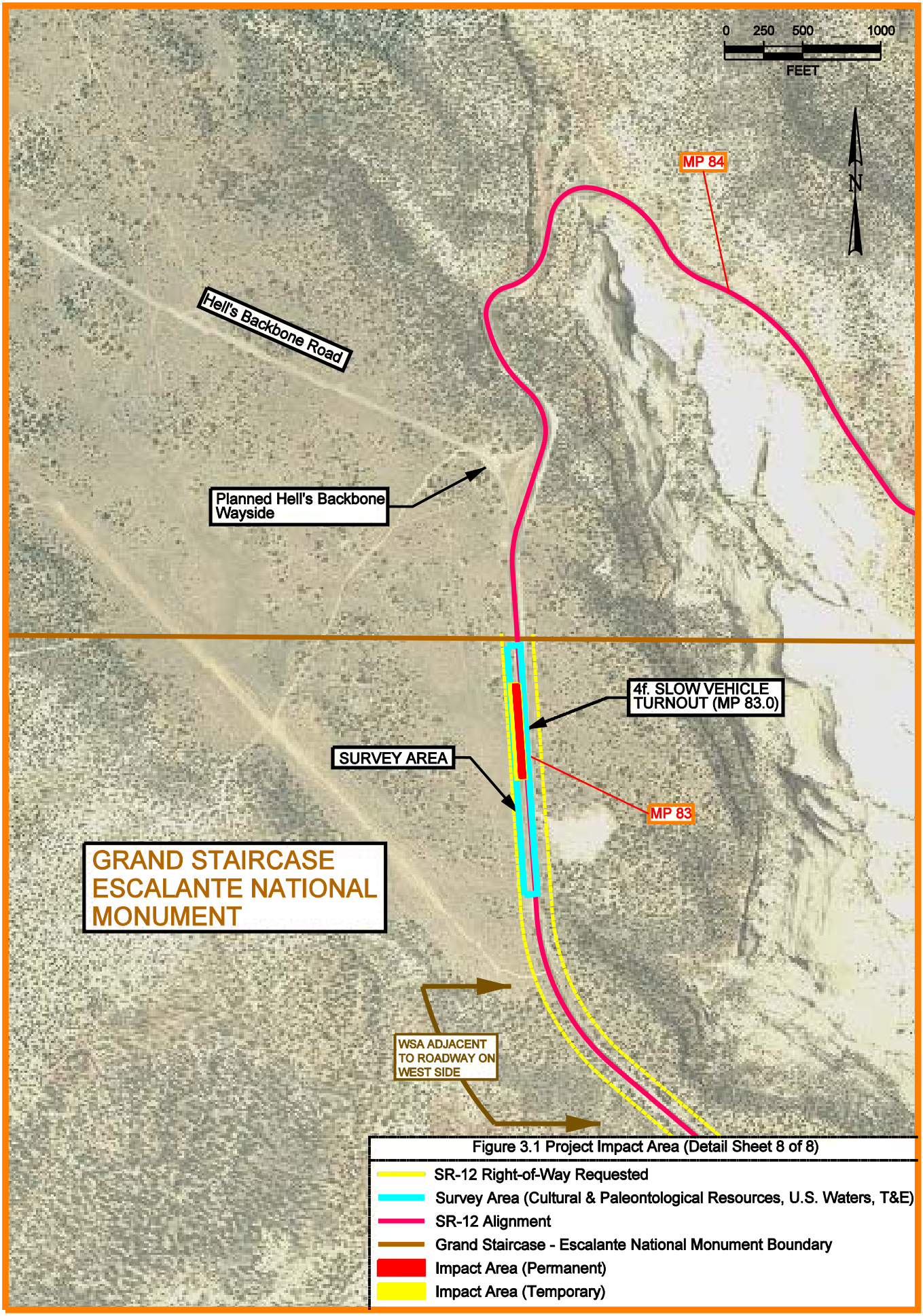


Figure 3.1 Project Impact Area (Detail Sheet 7 of 8)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FEET
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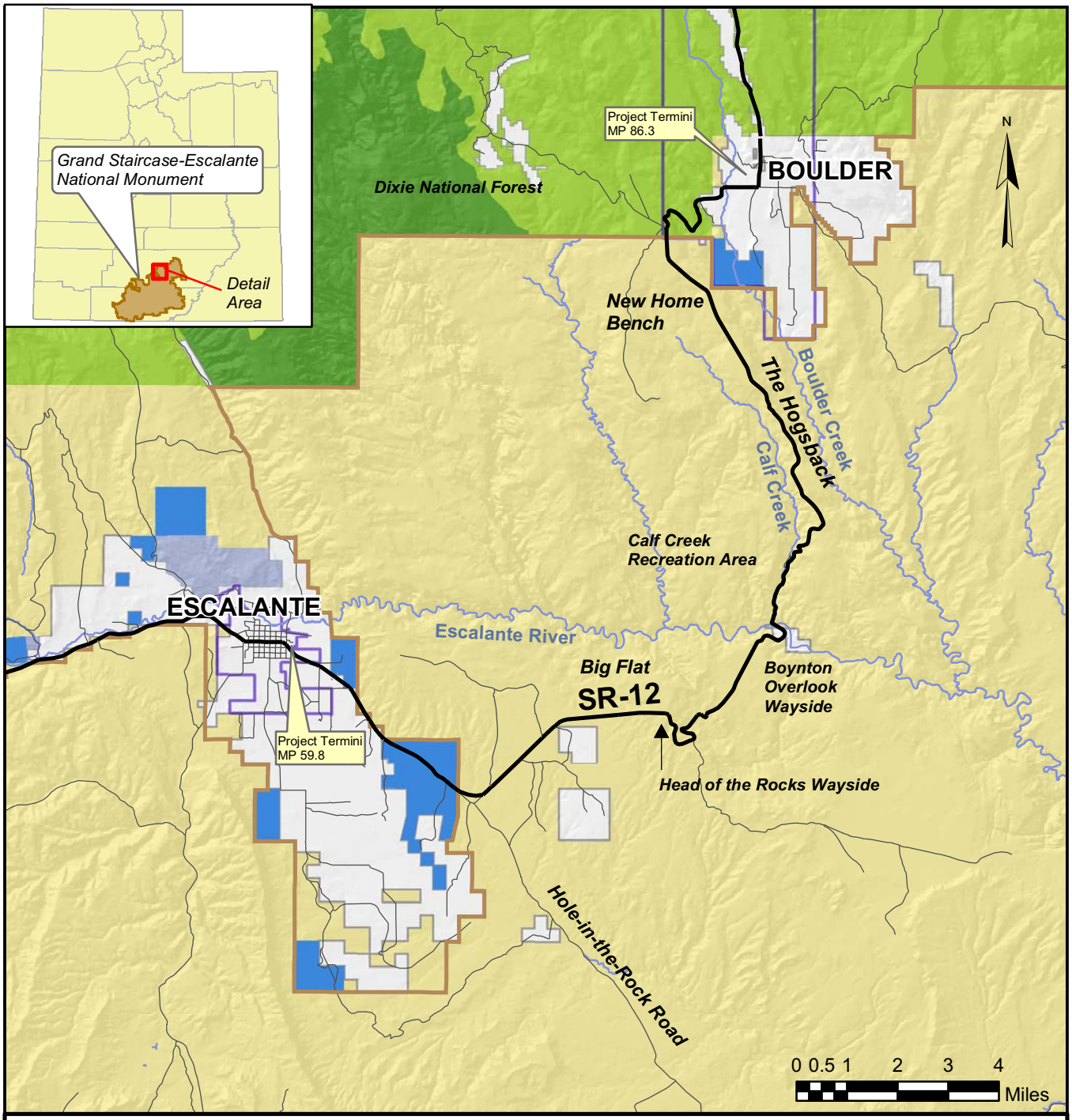
MP 84
Hell's Backbone Road
Planned Hell's Backbone Wayside
4f. SLOW VEHICLE TURNOUT (MP 83.0)
SURVEY AREA
MP 83
GRAND STAIRCASE ESCALANTE NATIONAL MONUMENT
WSA ADJACENT TO ROADWAY ON WEST SIDE
Figure 3.1 Project Impact Area (Detail Sheet 8 of 8)
SR-12 Right-of-Way Requested
Survey Area (Cultural & Paleontological Resources, U.S. Waters, T&E)
SR-12 Alignment
Grand Staircase - Escalante National Monument Boundary
Impact Area (Permanent)
Impact Area (Temporary)



LAND OWNERSHIP

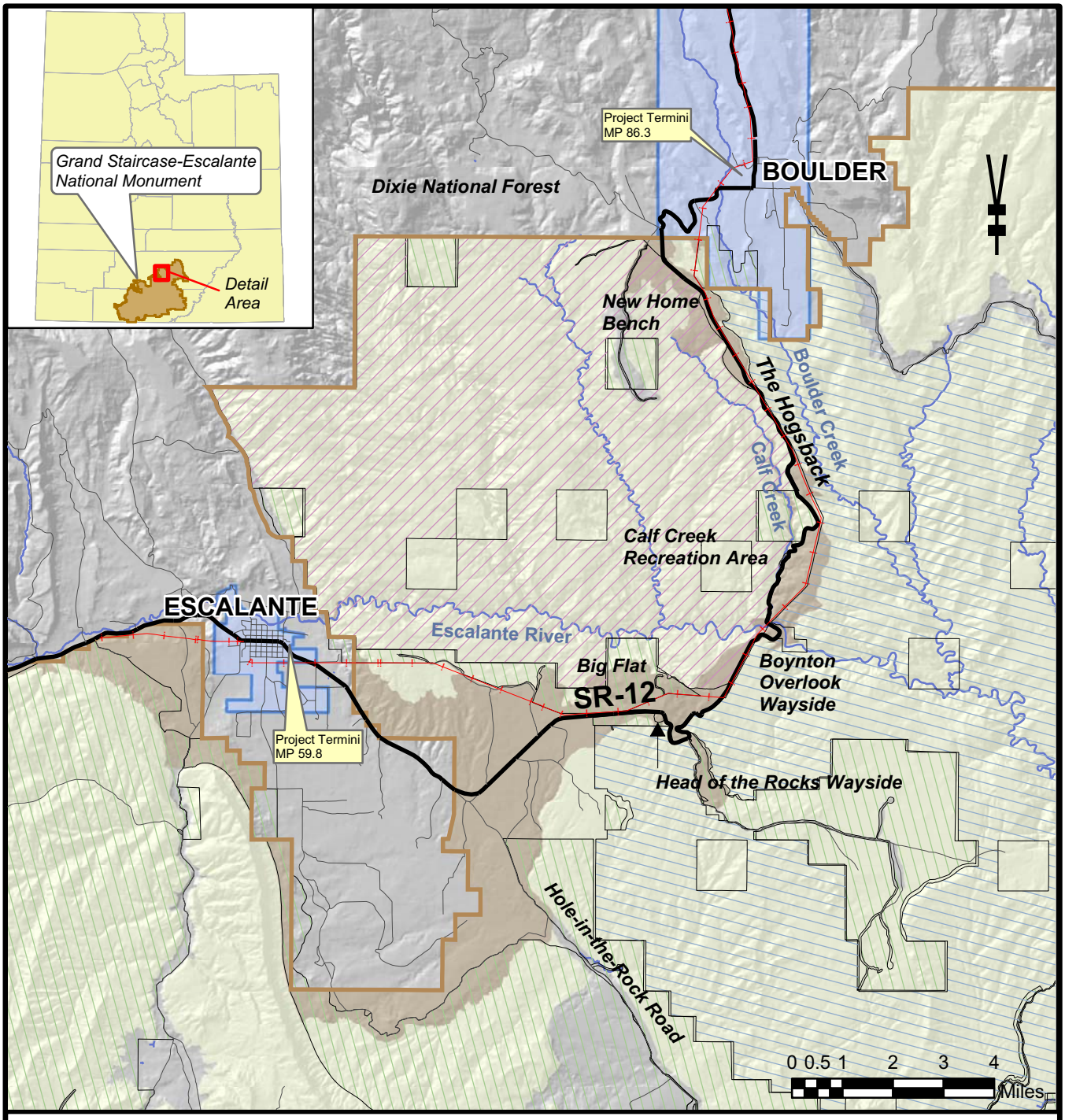
- State Route 12
- Grand Staircase-Escalante National Monument Boundary
- Local Roads
- Stream
- Municipal Boundaries

Land Ownership/Administration

- Bureau of Land Management (BLM)
- Private
- State Parks & Recreation Areas
- U.S. Forest Service (USFS)
- State Institutional Trust Lands

*Sources: AGRC (2002), BLM Grand Staircase-Escalante National Monument (2006), and Garfield County (2003)

SR-12 Escalante to Boulder	STP-0012(8)60E	Figure No. 3.2
		December 2007



LAND MANAGEMENT

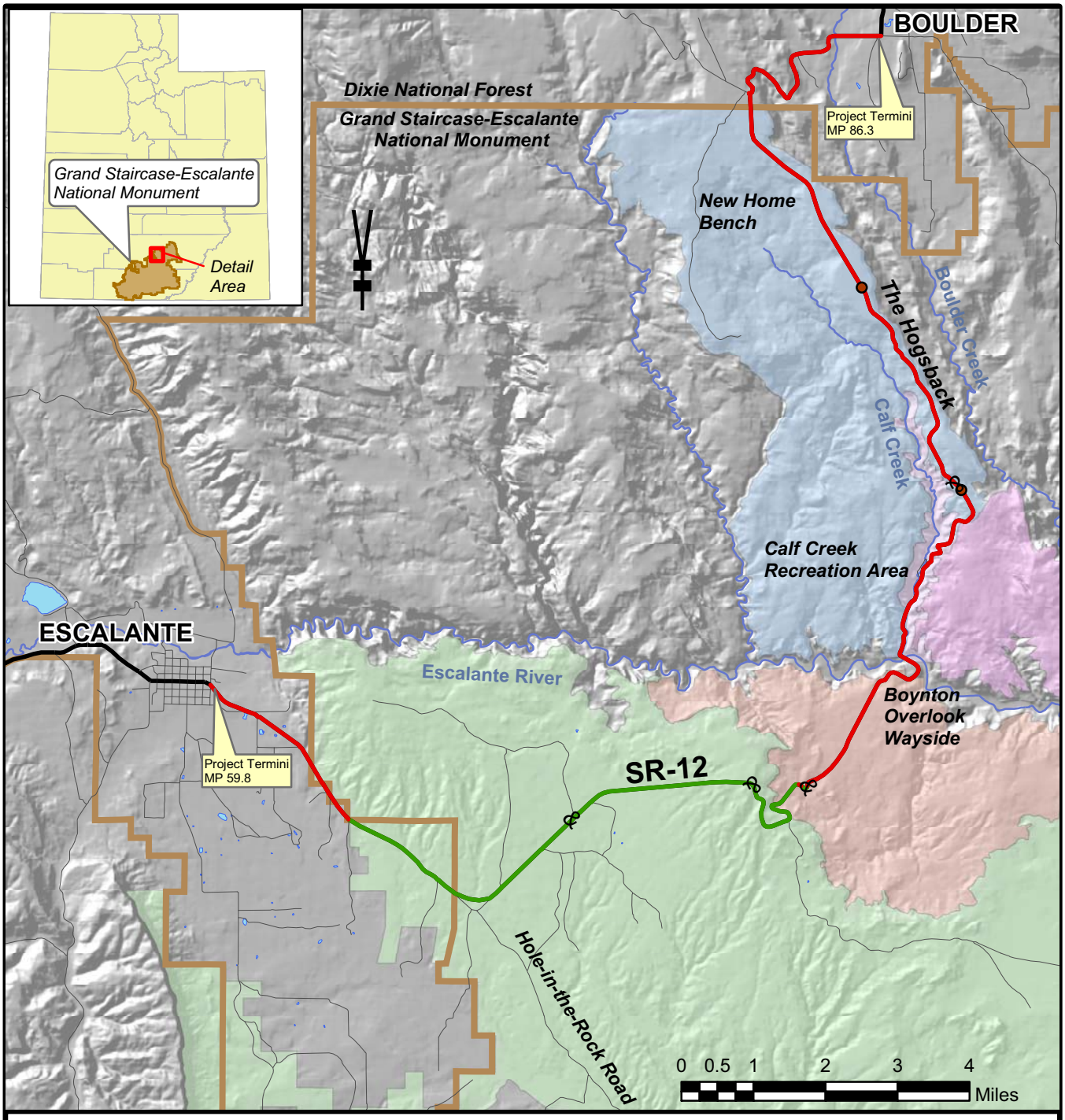
- Grand Staircase-Escalante National Monument Boundary
- State Route 12
- Local Roads
- Stream
- Power Lines
- BLM WSA - North Escalante Canyons/The Gulch
- BLM WSA - Phipps-Death Hollow
- BLM non-WSA lands w. wilderness characteristics
- Municipalities
- Terrain

Management Zone

- Frontcountry
- Primitive

*Sources: AGRC (2002), BLM Grand Staircase-Escalante National Monument (2006), and Garfield County (2003)

SR-12 Escalante to Boulder	STP-0012(8)60E	Figure No. 3.3
		December 2007



CATTLE AND GRAZING ALLOTMENTS

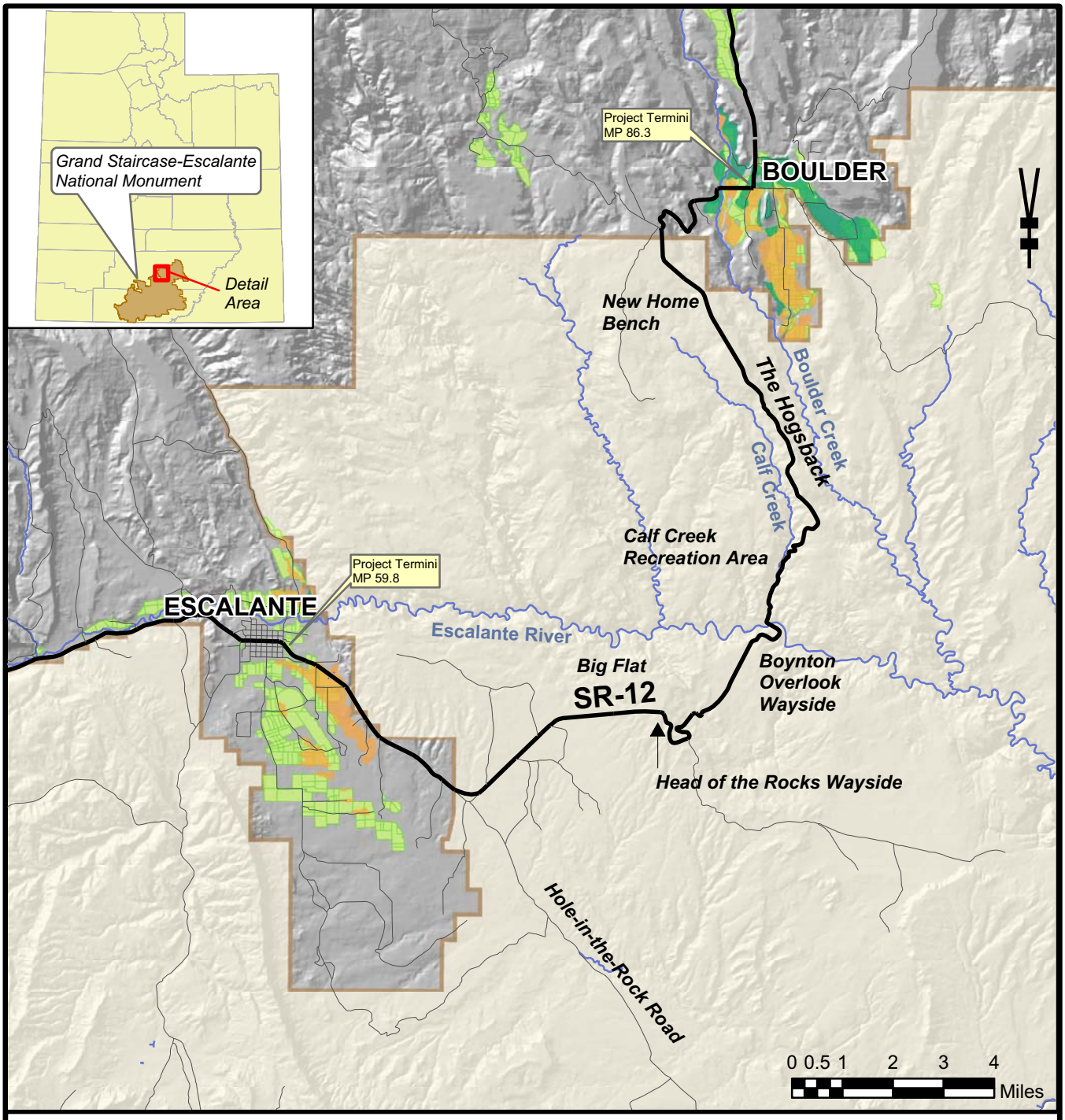
- & Cattle Access Gates
- Cattle Trailer Release Points
- Unfenced
- Fenced for Cattle
- Local Roads
- Stream
- Grand Staircase-Escalante Natl. Mon. Boundary

- Big Horn
- Haymaker Bench
- Phipps
- Willow Gulch
- Willow Gulch (Closed)

Note: Permittees trail cattle from Boulder to allotment in fall/winter and back to Boulder in May/June.

*Sources: AGRC (2002), BLM Grand Staircase-Escalante National Monument (2006), and Garfield County (2003)

SR-12 Escalante to Boulder	STP-0012(8)60E	Figure No. 3.4
		December 2007



PRIME AND UNIQUE FARMLANDS

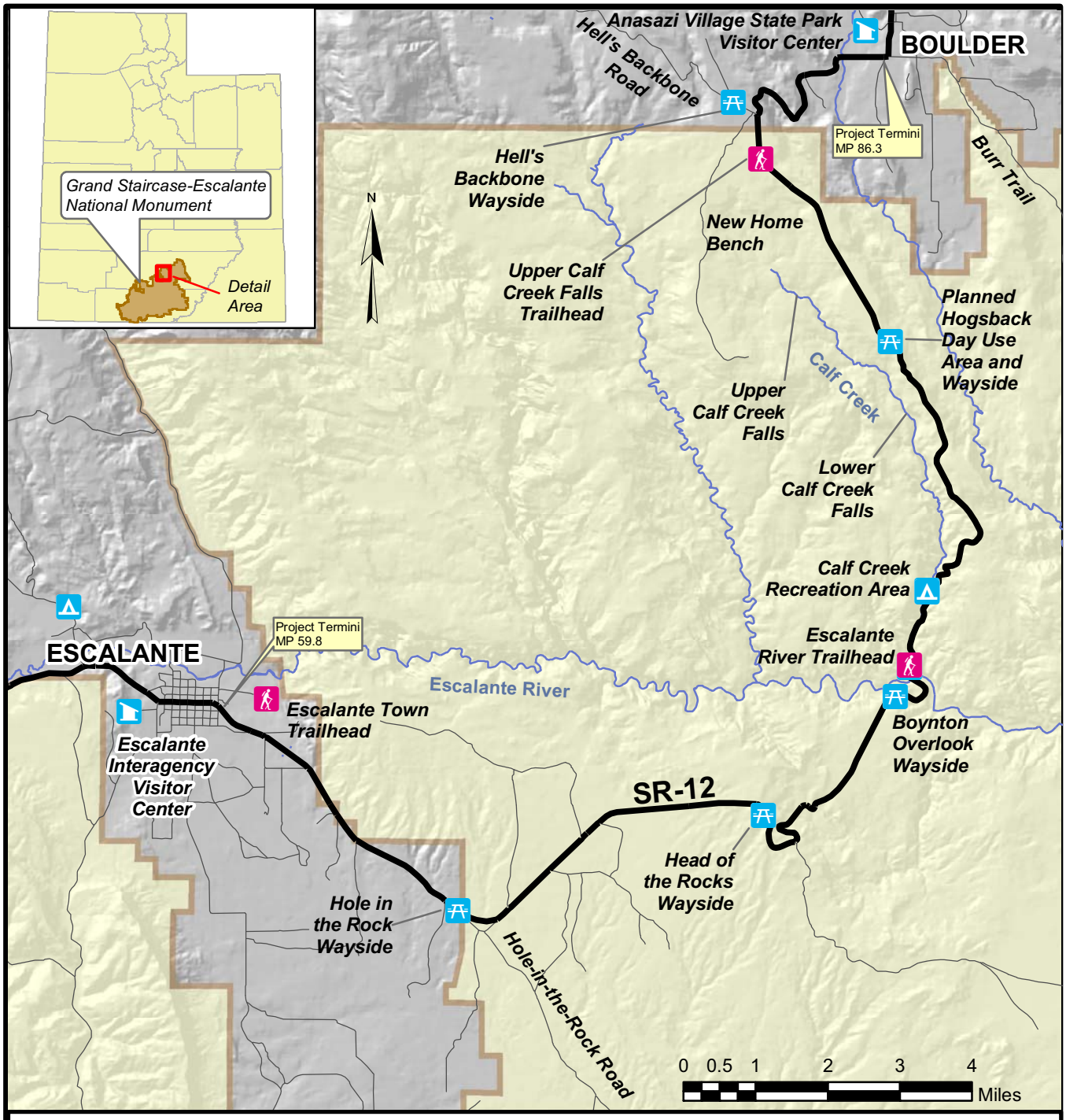
- Grand Staircase-Escalante National Monument Boundary
- State Route 12
- Local Roads
- Stream

Prime and Unique Farmlands

- Prime Farmlands
- Farmlands of State Importance
- Other Farmlands

*Sources: AGRC (2002), BLM Grand Staircase-Escalante National Monument (2006), and Garfield County (2003)

SR-12 Escalante to Boulder	STP-0012(8)60E	Figure No. 3.5
		December 2007



RECREATION RESOURCES

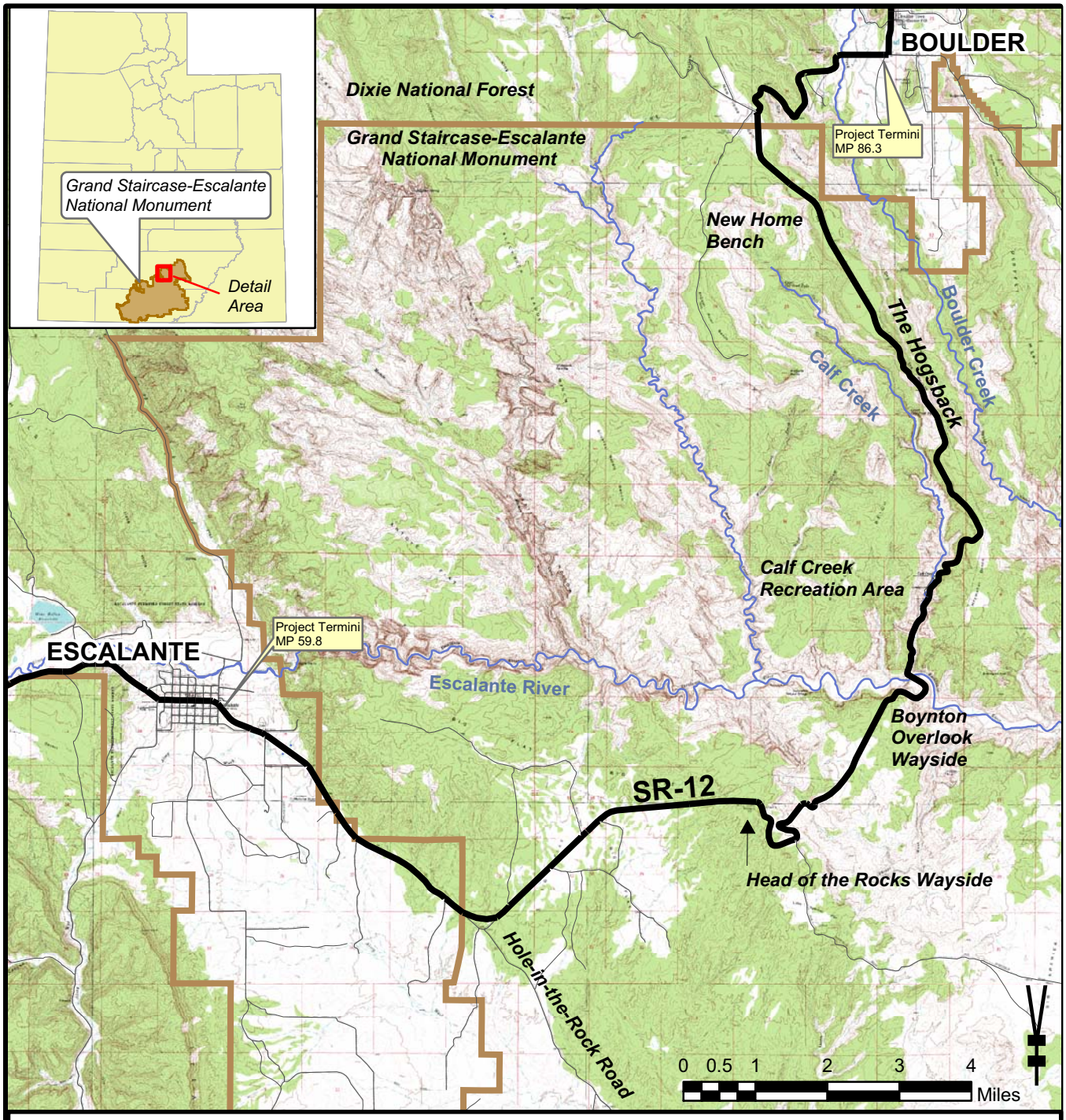
Grand Staircase-Escalante National Monument
State Route 12
Local Roads
Stream

Public Recreation Areas

Recreation Areas / Campgrounds
Trailheads
Waysides

*Sources: AGRC (2002), BLM Grand Staircase-Escalante National Monument (2006), and Garfield County (2003)

SR-12 Escalante to Boulder	STP-0012(8)60E	Figure No. 3.6	
		December 2007	



USGS TOPOGRAPHIC

Grand Staircase-Escalante National Monument Boundary
State Route 12
Local Roads
Stream

*Sources: AGRC (2002), BLM Grand Staircase-Escalante National Monument (2006), and Garfield County (2003)

SR-12 Escalante to Boulder	STP-0012(8)60E	Figure No. 3.7 December 2007	

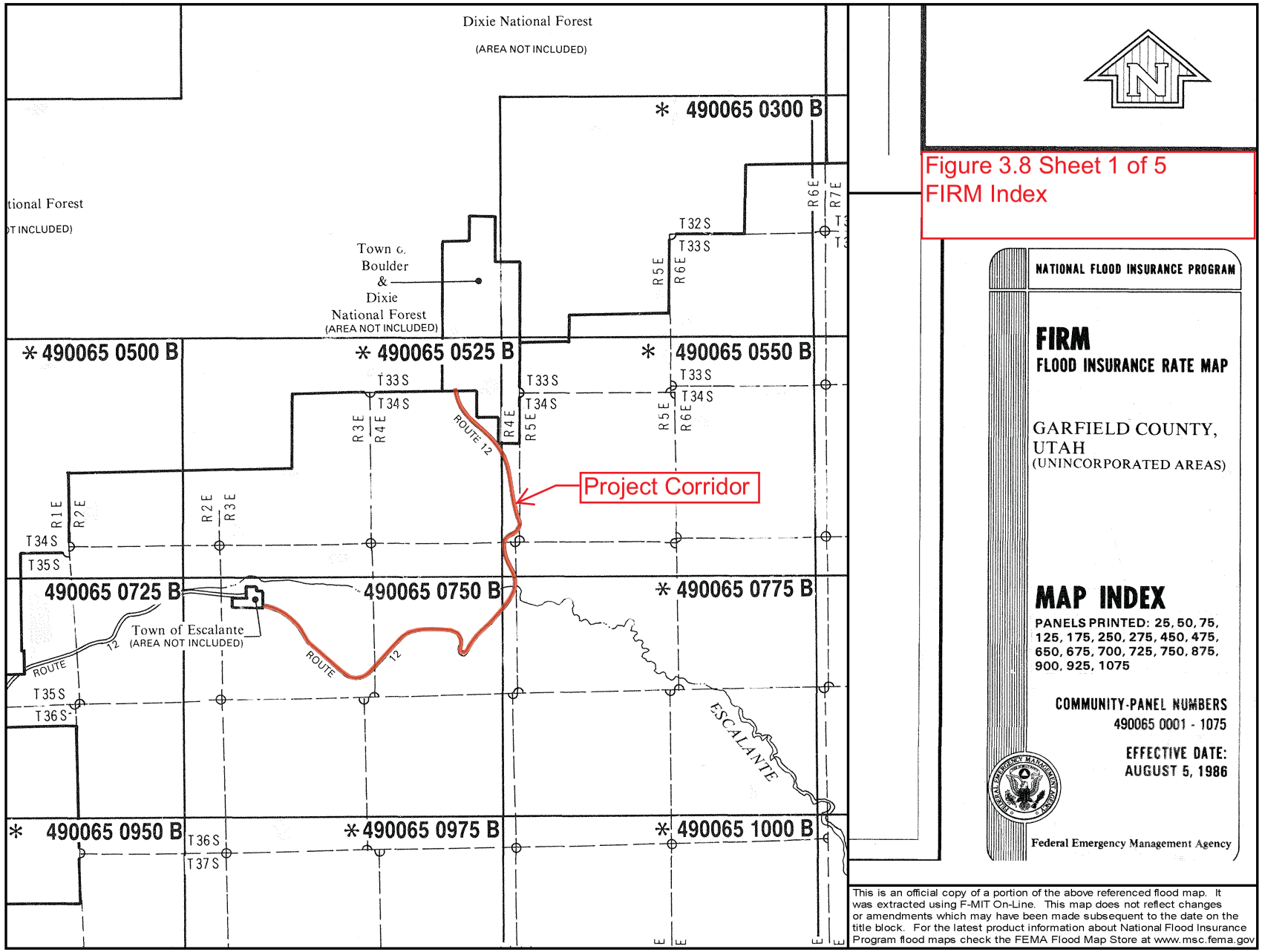


Figure 3.8 Sheet 1 of 5
FIRM Index

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

GARFIELD COUNTY, UTAH
(UNINCORPORATED AREAS)

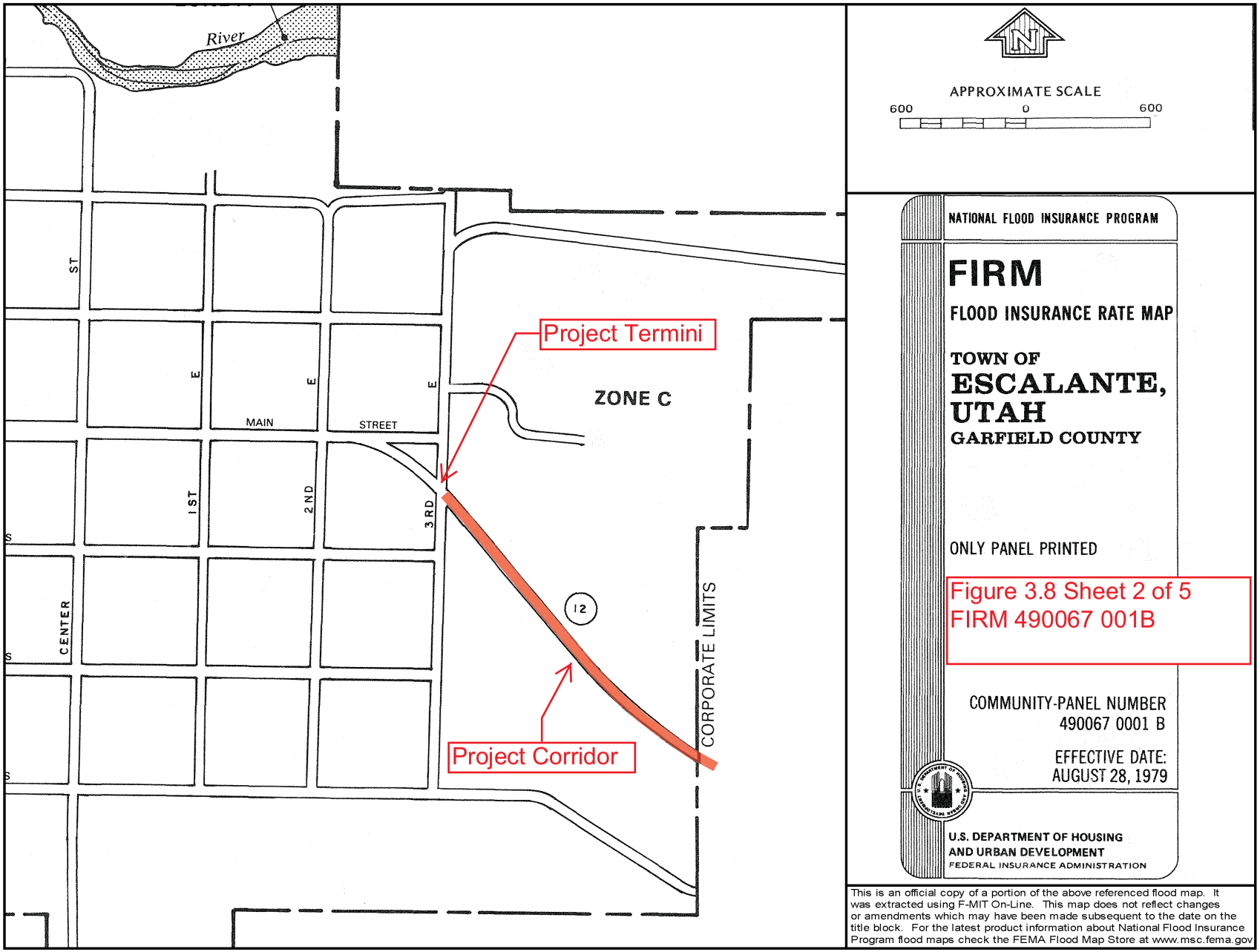
MAP INDEX

PANELS PRINTED: 25, 50, 75, 125, 175, 250, 275, 450, 475, 650, 675, 700, 725, 750, 875, 900, 925, 1075

COMMUNITY-PANEL NUMBERS
490065 0001 - 1075

EFFECTIVE DATE:
AUGUST 5, 1986

Federal Emergency Management Agency


River
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12
CORPORATE LIMITS
Project Corridor
APPROXIMATE SCALE
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0
600
NATIONAL FLOOD INSURANCE PROGRAM
FIRM
FLOOD INSURANCE RATE MAP
TOWN OF
ESCALANTE,
UTAH
GARFIELD COUNTY
ONLY PANEL PRINTED
Figure 3.8 Sheet 2 of 5
FIRM 490067 001B
COMMUNITY-PANEL NUMBER
490067 0001 B
EFFECTIVE DATE:
AUGUST 28, 1979
U.S. DEPARTMENT OF HOUSING
AND URBAN DEVELOPMENT
FEDERAL INSURANCE ADMINISTRATION
This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

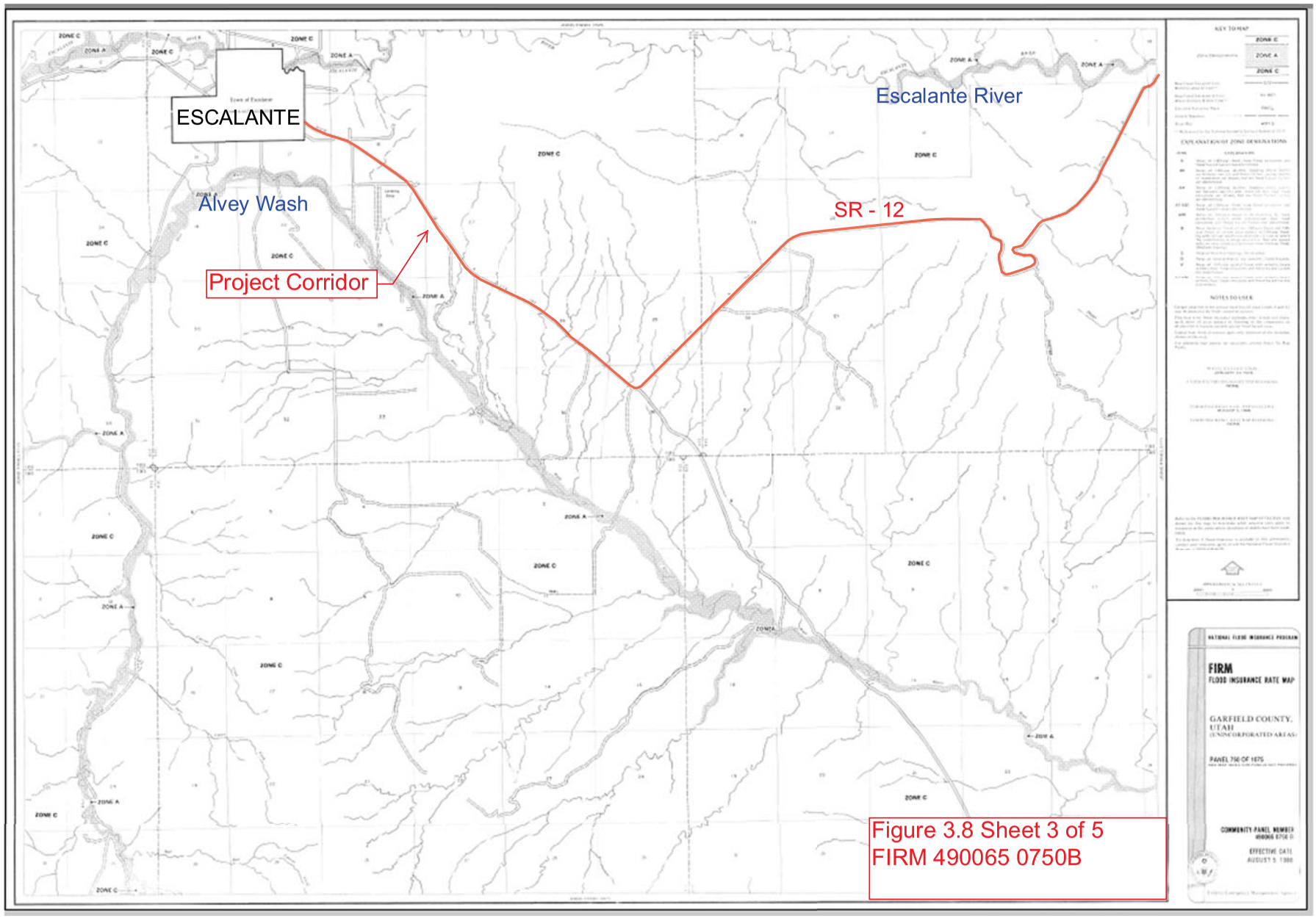


Figure 3.8 Sheet 3 of 5
FIRM 490065 0750B

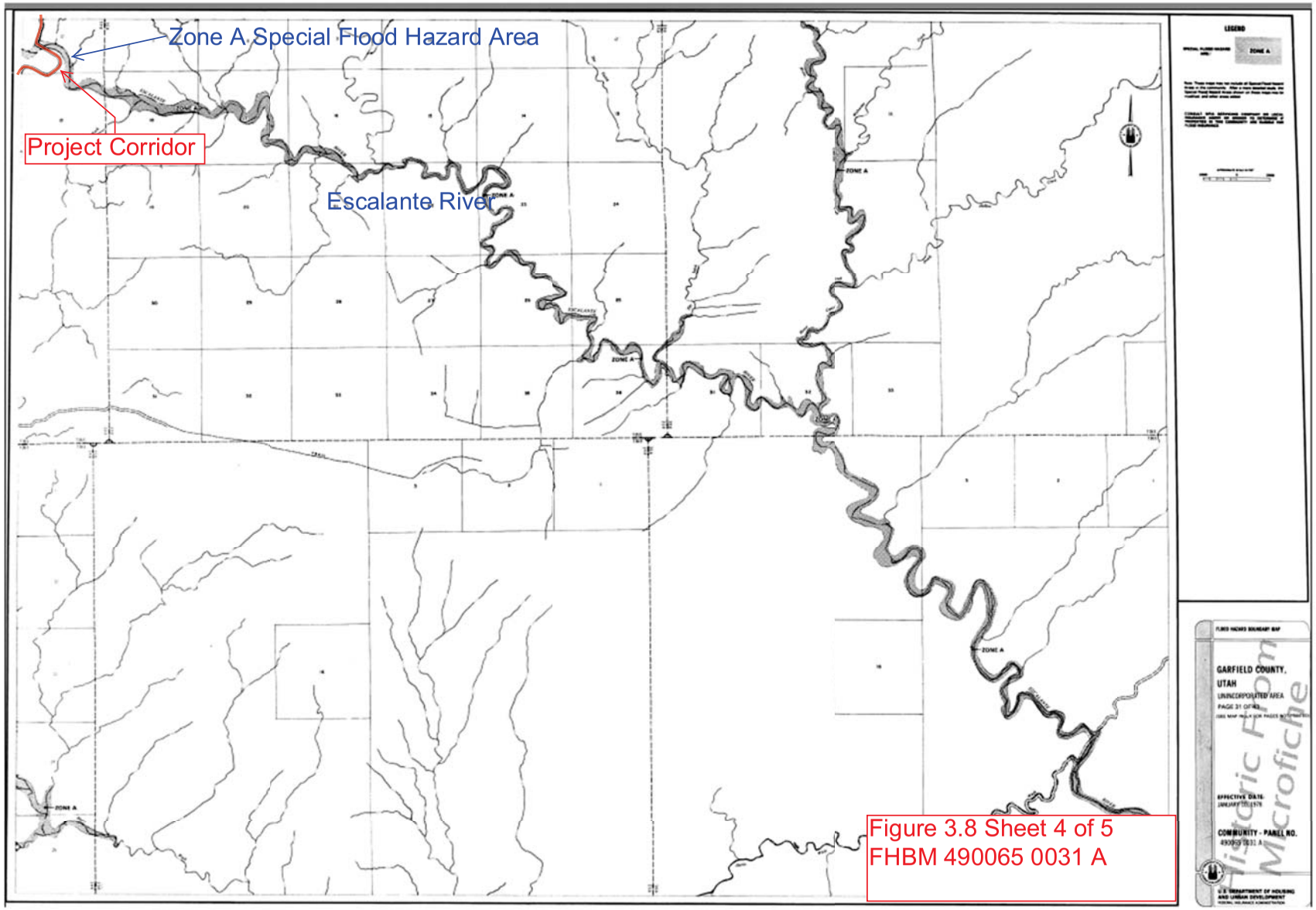


Figure 3.8 Sheet 4 of 5
FHBM 490065 0031 A

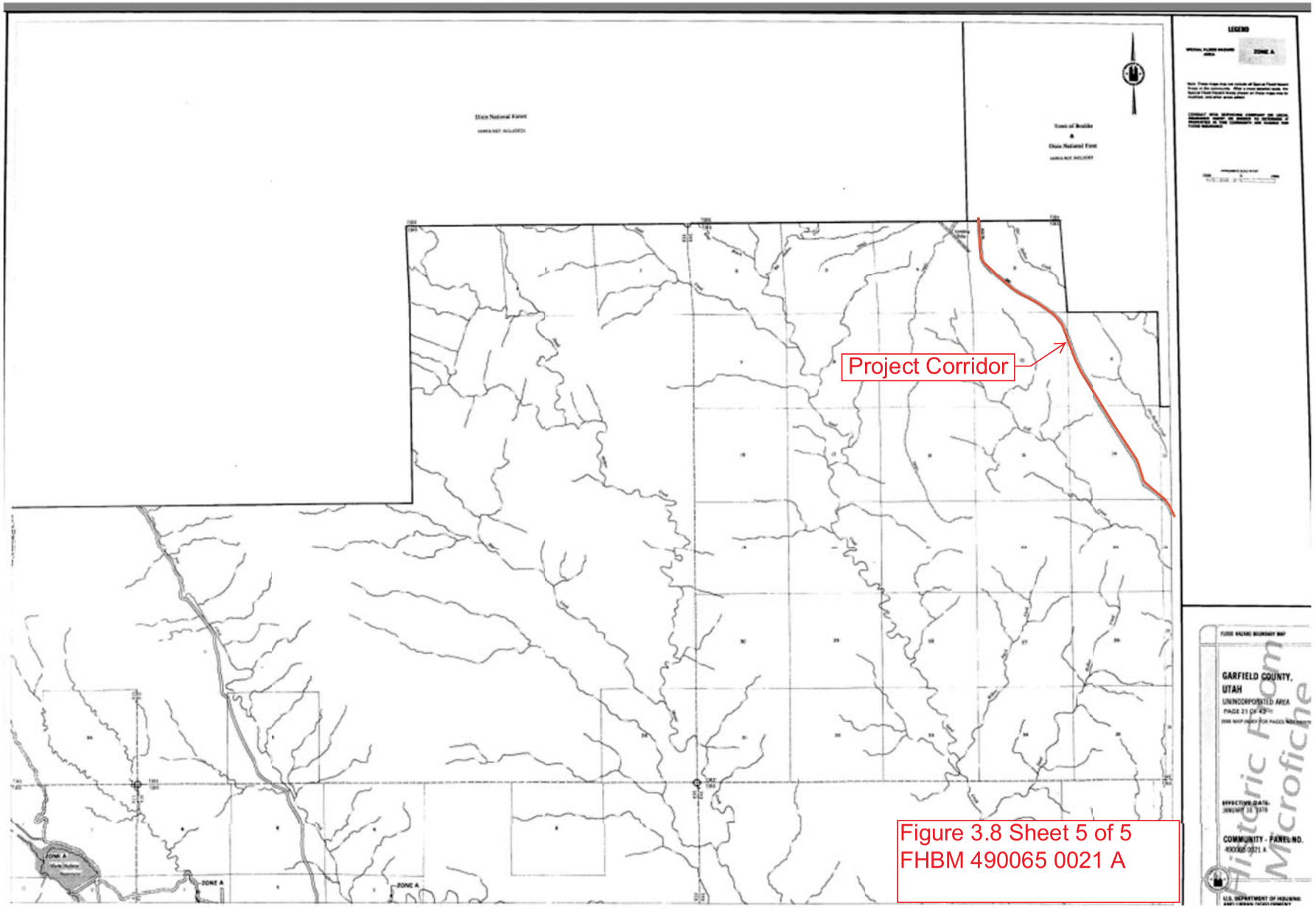
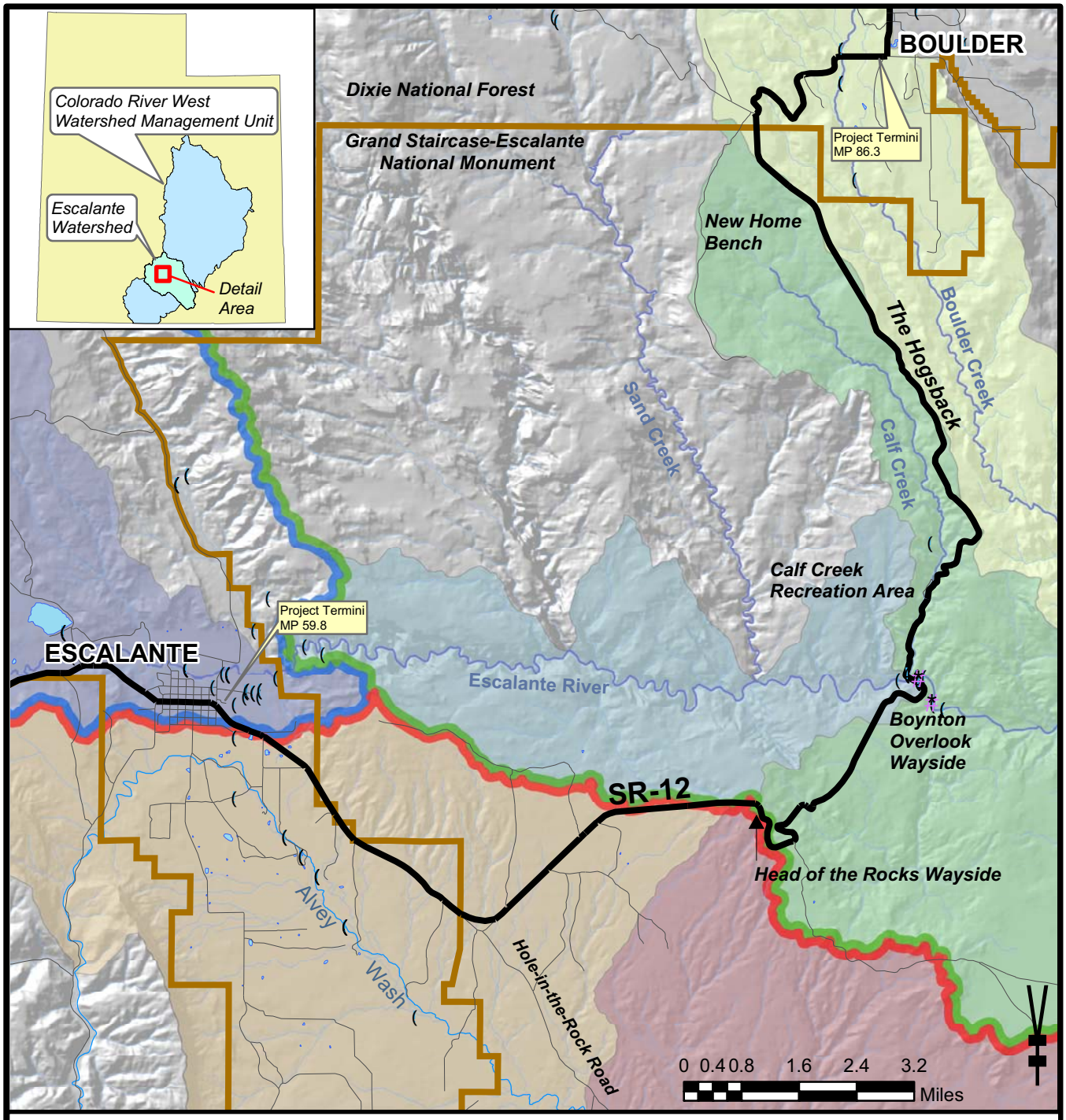


Figure 3.8 Sheet 5 of 5
FHBM 490065 0021 A



SURFACE WATER

- Grand Staircase-Escalante National Monument Boundary
- State Route 12
- Local Roads
- Stream
- Intermittent Stream
- Spring
- Diversion from stream

Watershed (HUC 10)

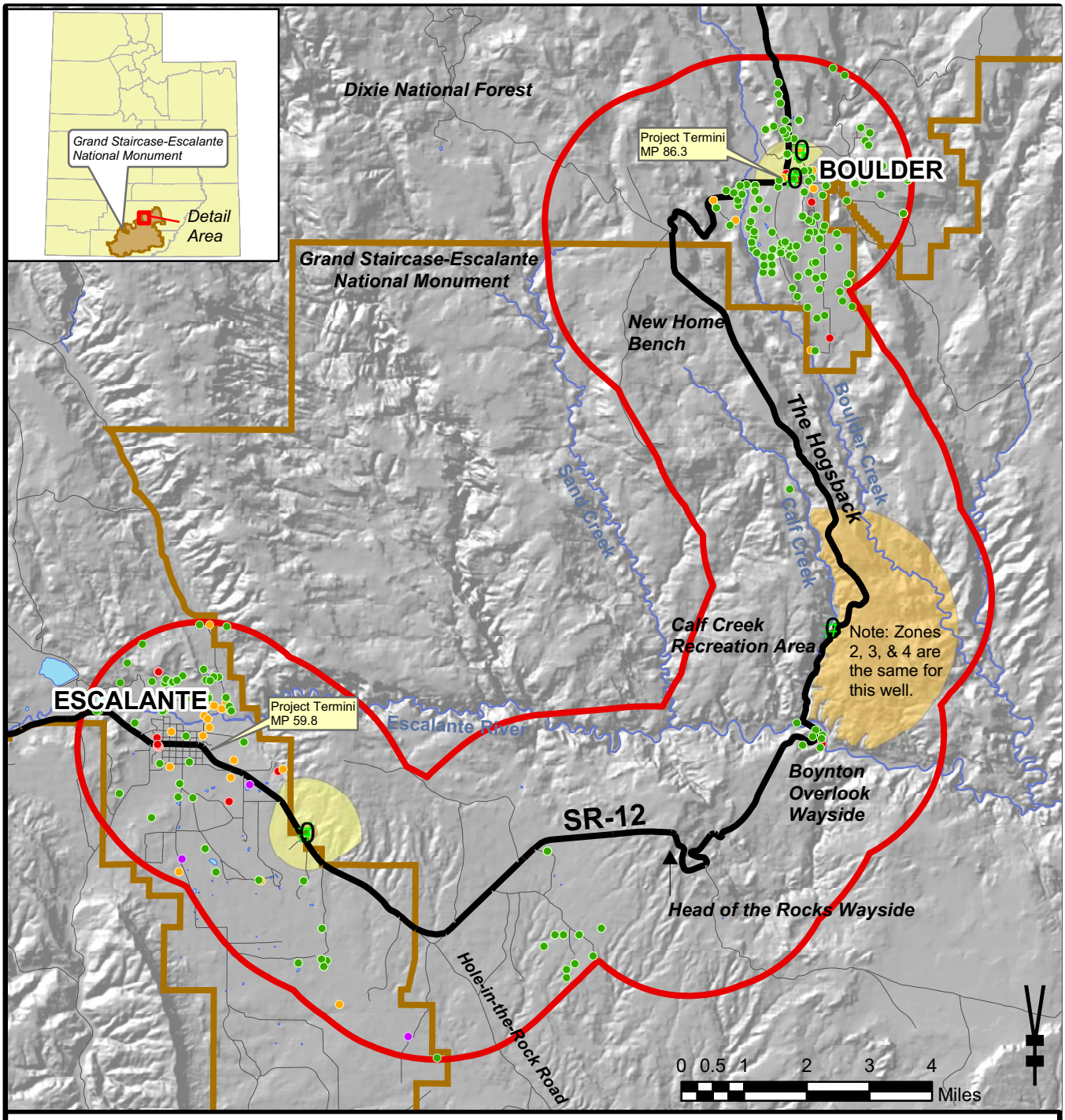
- Headwaters Escalante River
- Boulder Creek-Escalante River
- Harrish Wash

Sub-Watershed (HUC 12)

- Alvey Wash
- Bear Creek-Boulder Creek
- Big Flat-Escalante River
- Calf Creek-Escalante River
- Upper Harris Wash
- Wide Hollow Reservoir-Escalante River

*Sources: AGRC (2002), BLM Grand Staircase-Escalante National Monument (2006), and Garfield County (2003)

SR-12 Escalante to Boulder	STP-0012(8)60E	Figure No. 3.9
		December 2007



GROUNDWATER

- Grand Staircase-Escalante National Monument Boundary
- State Route 12
- Local Roads
- Drinking Water Sources

Private Groundwater Sources

- Domestic (Note: Wells shown as domestic may also have other uses.)
- Irrigation
- Municipal
- Stock Watering
- Other

- Groundwater Study Area (2 miles from corridor)
- Stream

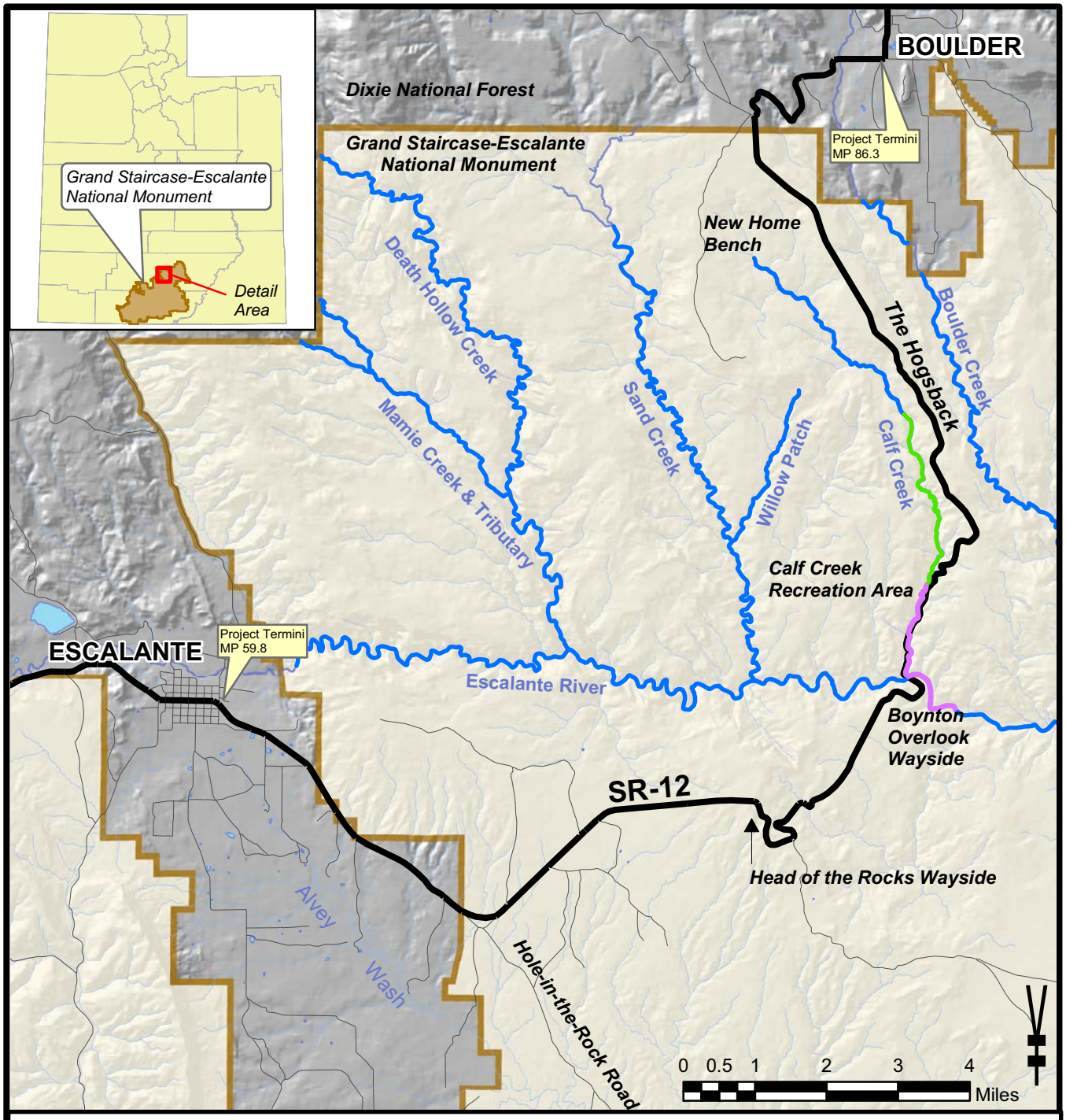
Source Water Protection Zone

- Zone 1 (100-Foot Radius)
- Zone 2
- Zone 3
- Zone 4

(Note: Source Water Protection Zones may overlap.)

*Sources: AGRC (2002), BLM Grand Staircase-Escalante National Monument (2006), and Garfield County (2003)

SR-12 Escalante to Boulder	STP-0012(8)60E	Figure No. 3.10
		December 2007



WILD AND SCENIC RIVERS—SUITABLE SEGMENTS

- Grand Staircase-Escalante National Monument Boundary
- State Route 12
- Local Roads
- Stream
- Intermittent Stream

River Classes

- Recreational
- Scenic
- Wild

*Sources: AGRC (2002), BLM Grand Staircase-Escalante National Monument (2006), and Garfield County (2003)

SR-12 Escalante to Boulder	STP-0012(8)60E	Figure No. 3.11
		December 2007

NO.	MILE POST	IMPROVEMENT	FIGURE
PROPOSED RIGHT OF WAY			
1	68.9 to 83.1	SR-12 Corridor	2.2, sheet 1 to 4
1a	82.1	Stockpile Site	2.2, sheet 4
PROPOSED SPOT IMPROVEMENTS			
2	74.5	Replace Calf Creek Bridge	2.3
3		STABILIZE ROADWAY AND ROADSIDE	
3a	74.8	Stabilize Roadway	2.4, 2.4-A
3b	75.4	Stabilize Roadside	2.5 to 2.6-A
3c	77.5 to 77.7	Stabilize Roadside	2.7, 2.7-A
4		PROVIDE SLOW VEHICLE TURNOUTS	
4a	69.9	Westbound	2.8, 2.8-A
4b	71.7	Eastbound	2.9, 2.9-A
4c	72.5	Westbound	2.10, 2.10-A
4d	76.2	Eastbound	2.11, 2.11-A
4e	79.5	Eastbound	2.12, 2.12-A
4f	83	Westbound	2.13, 2.13-A
5		IMPROVE INTERSECTIONS	
5a	64.4	Hole-in-the-Rock Road	2.14, 2.14-A
5b	75	Calf Creek Recreation Area	2.15, 2.15-A
6	71	Widen Narrow Curve	2.16, 2.16-A
7	*	Improve Signing	

* (locations to be determined during design so these are not depicted on the map)

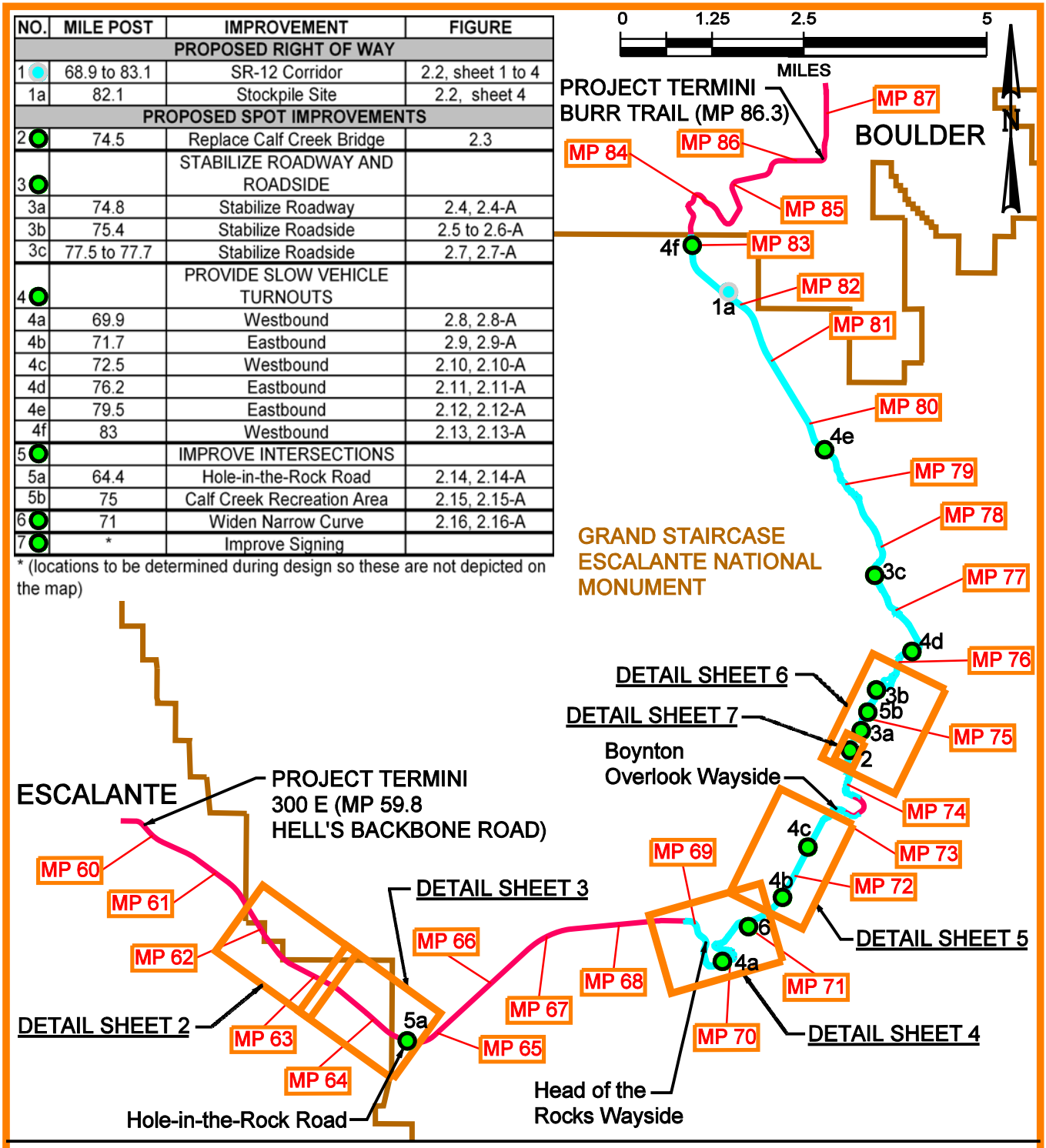


FIGURE 3.12 JURISDICTIONAL WATER FEATURES

SR-12 Existing Right-of-Way

SR-12 Right-of-Way Requested

Additional Right-of-Way Requested for Stockpile Site

Location of Proposed Spot Improvement

Grand Staircase - Escalante National Monument Boundary

Detail Sheets (See Sheets 2 - 7)

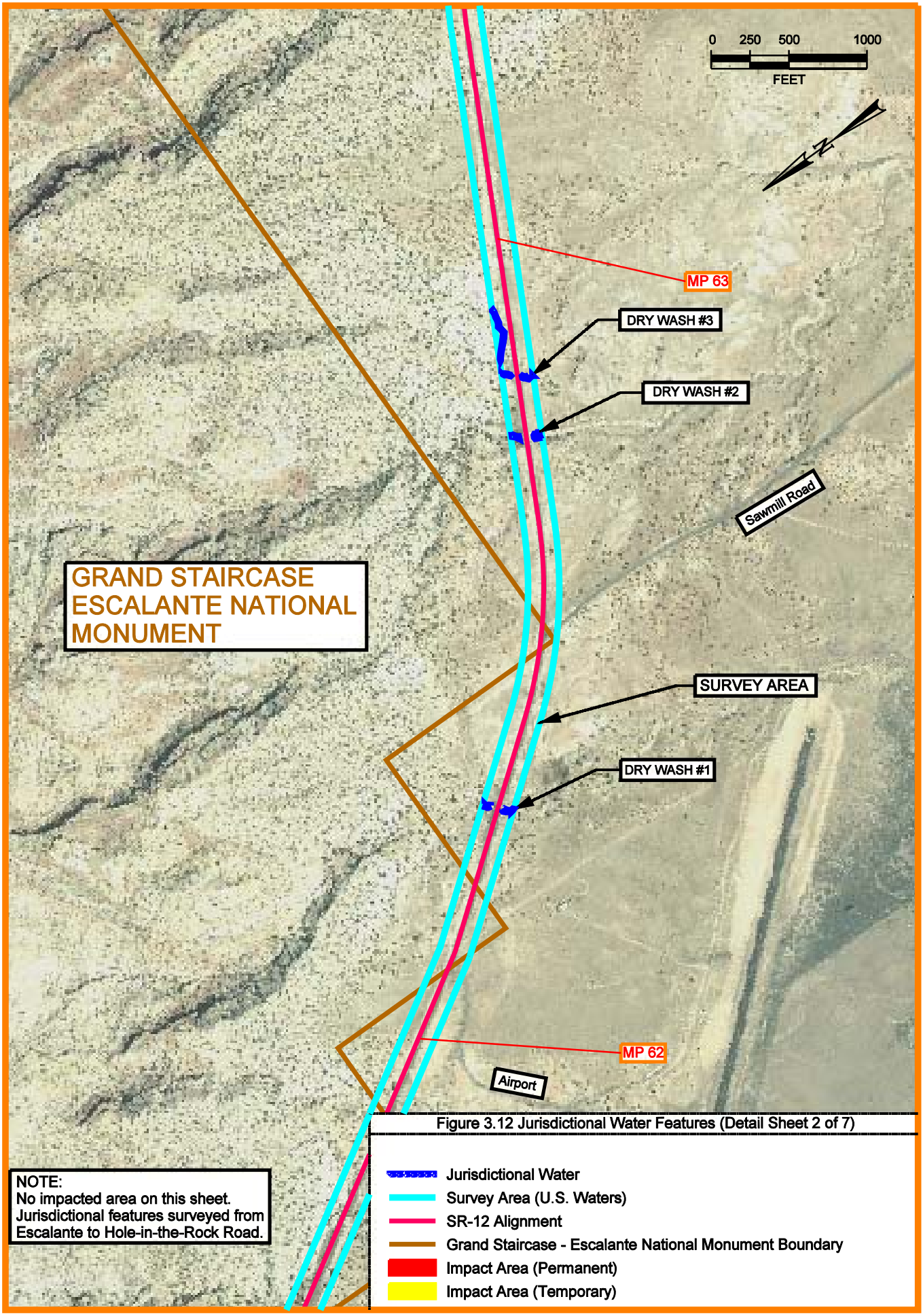


Figure 3.12 Jurisdictional Water Features (Detail Sheet 2 of 7)

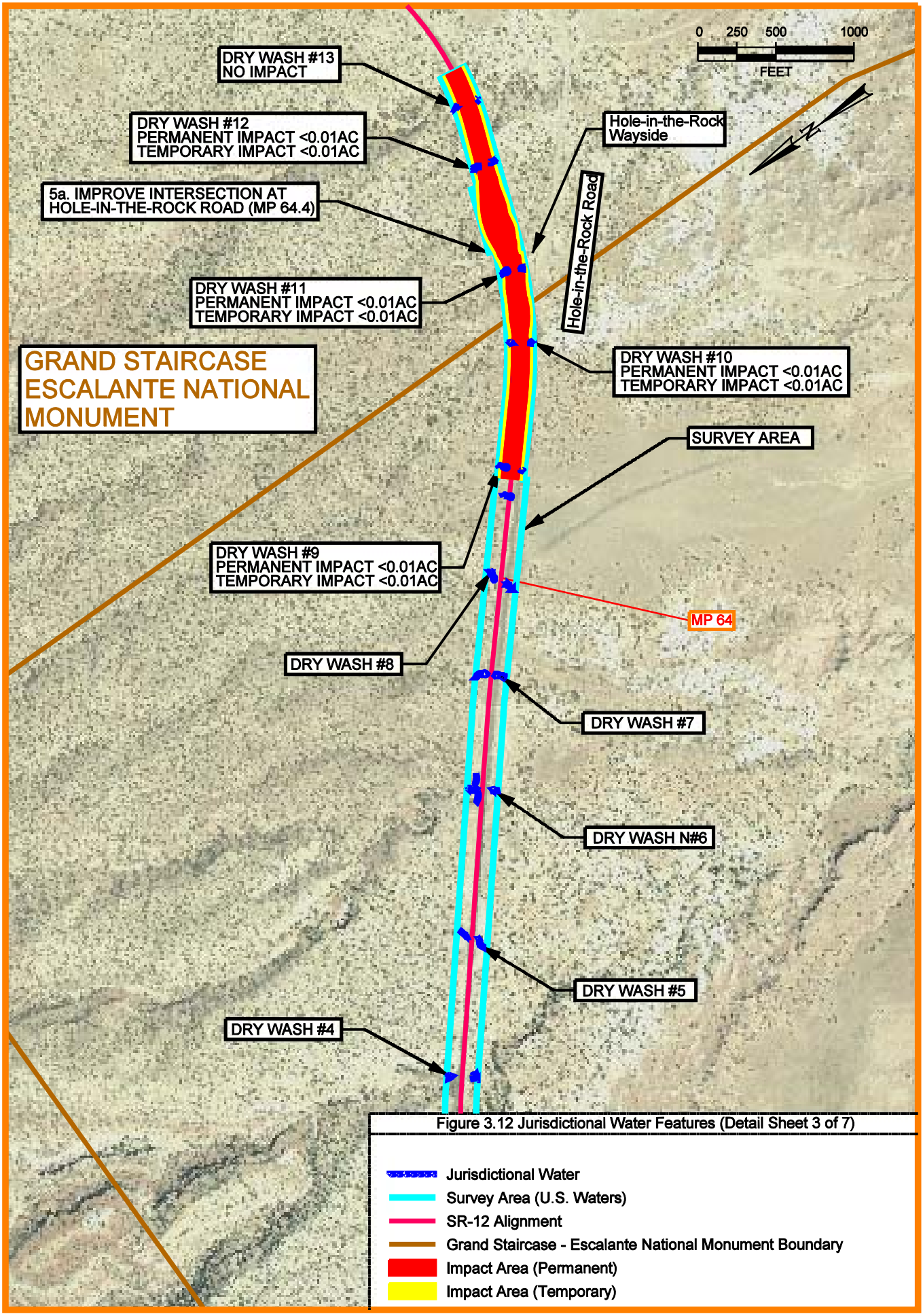
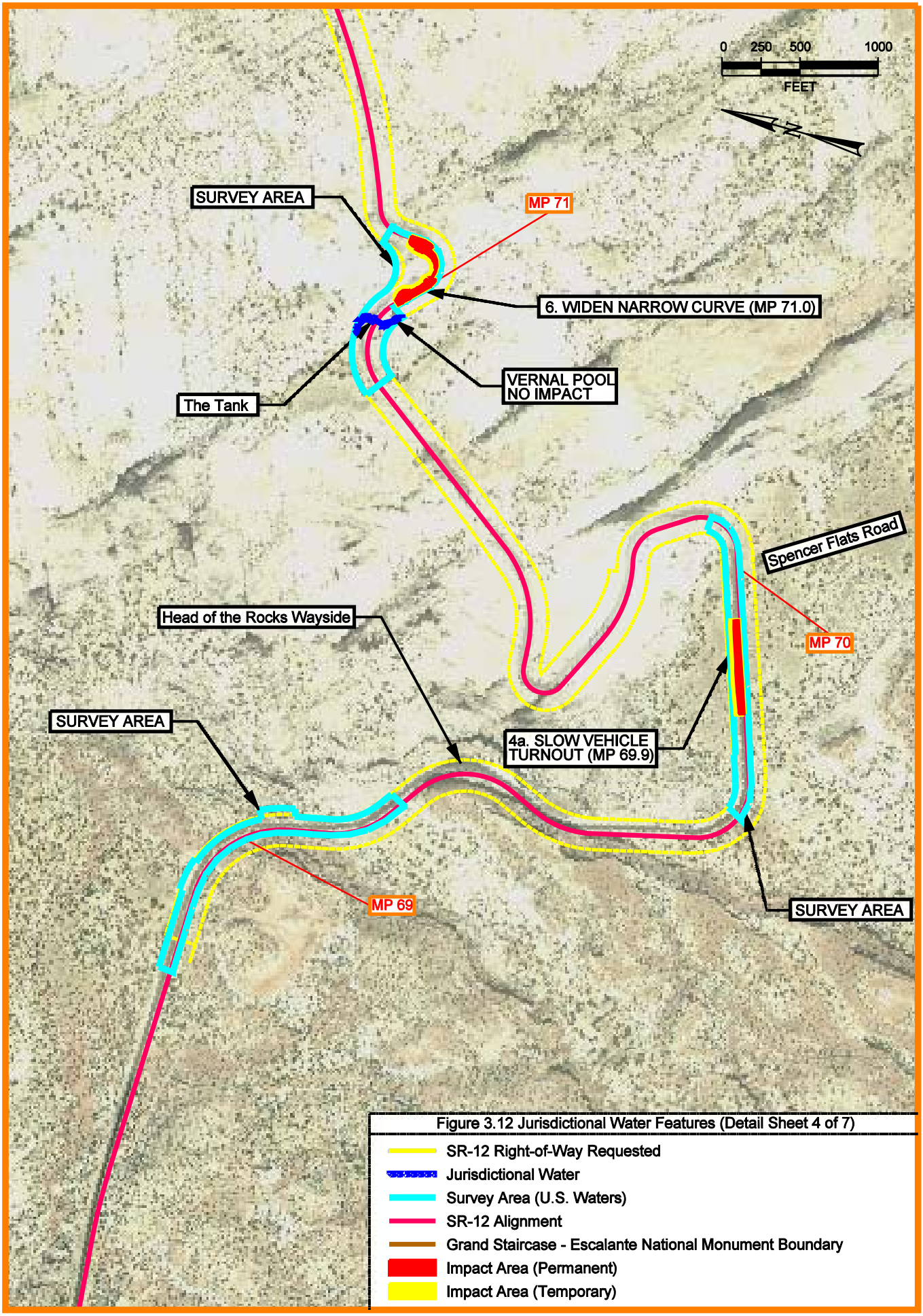


Figure 3.12 Jurisdictional Water Features (Detail Sheet 3 of 7)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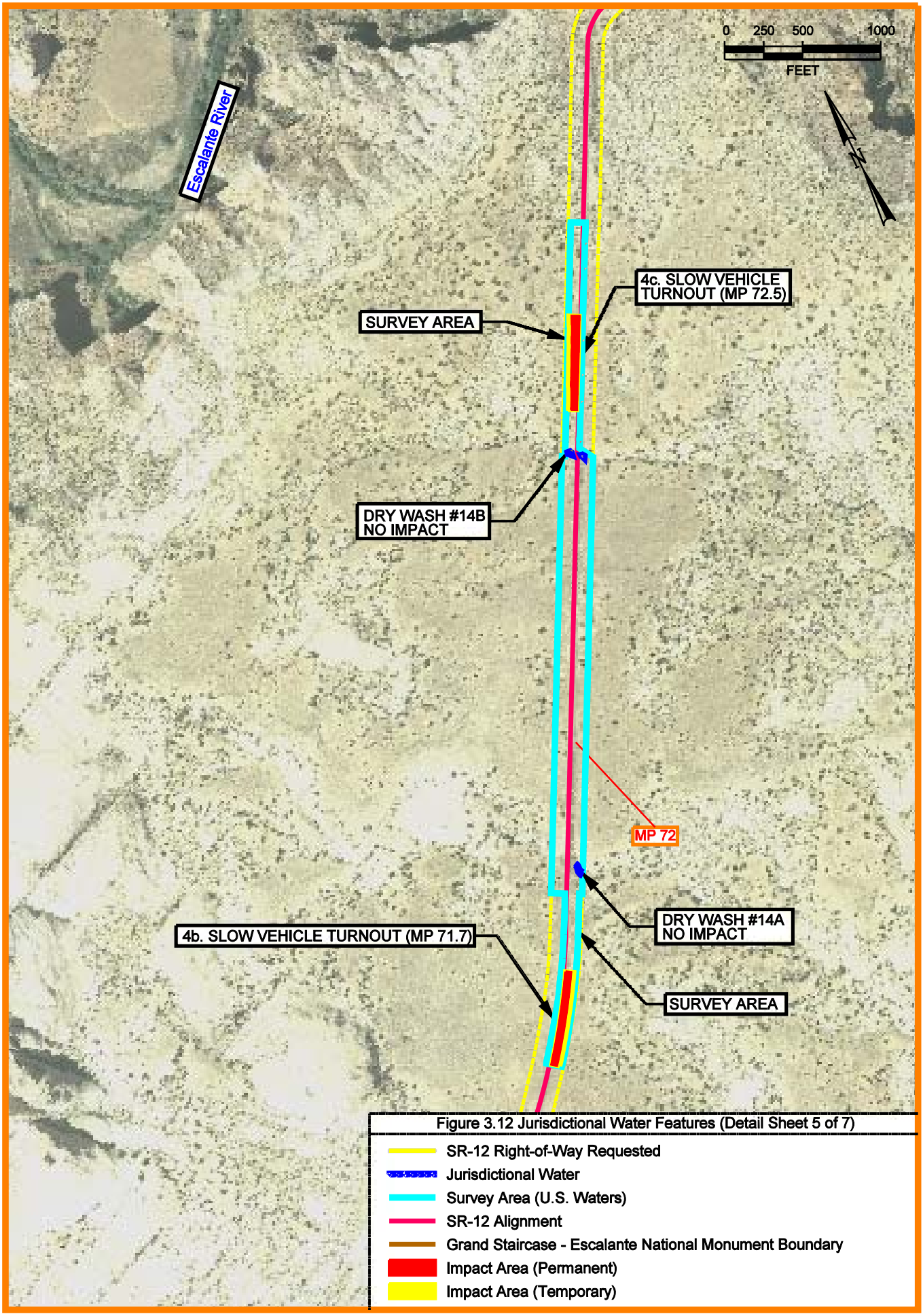
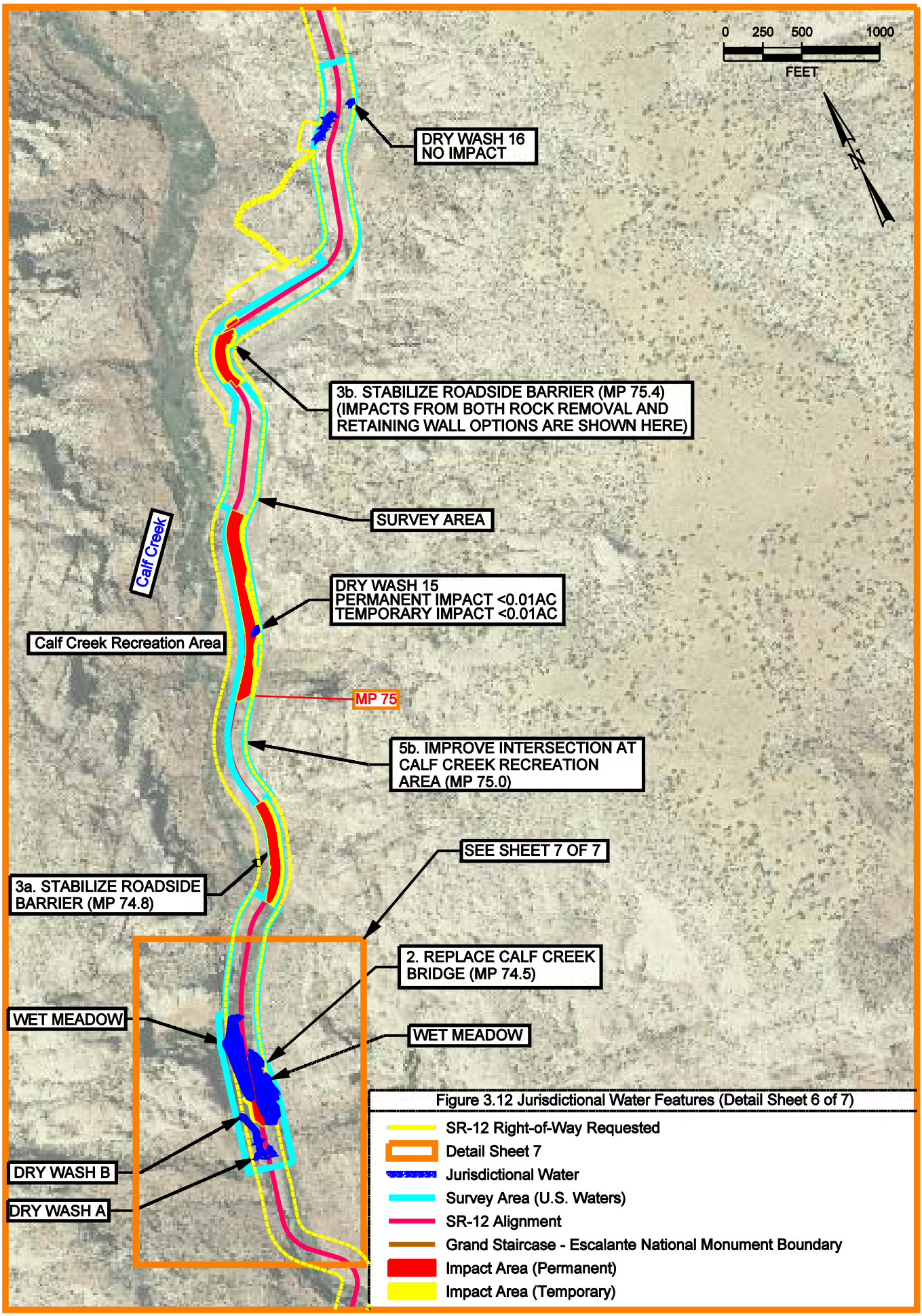
FEET
N
SURVEY AREA
MP 71
6. WIDEN NARROW CURVE (MP 71.0)
VERNAL POOL
NO IMPACT
The Tank
Spencer Flats Road
MP 70
Head of the Rocks Wayside
SURVEY AREA
4a. SLOW VEHICLE
TURNOUT (MP 69.9)
MP 69
SURVEY AREA
Figure 3.12 Jurisdictional Water Features (Detail Sheet 4 of 7)
SR-12 Right-of-Way Requested
Jurisdictional Water
Survey Area (U.S. Waters)
SR-12 Alignment
Grand Staircase - Escalante National Monument Boundary
Impact Area (Permanent)
Impact Area (Temporary)


0 250 500 1000
FEET
Escalante River
4c. SLOW VEHICLE TURNOUT (MP 72.5)
SURVEY AREA
DRY WASH #14B NO IMPACT
MP 72
DRY WASH #14A NO IMPACT
4b. SLOW VEHICLE TURNOUT (MP 71.7)
SURVEY AREA
Figure 3.12 Jurisdictional Water Features (Detail Sheet 5 of 7)
SR-12 Right-of-Way Requested
Jurisdictional Water
Survey Area (U.S. Waters)
SR-12 Alignment
Grand Staircase - Escalante National Monument Boundary
Impact Area (Permanent)
Impact Area (Temporary)


0 250 500 1000
FEET
DRY WASH 16
NO IMPACT
3b. STABILIZE ROADSIDE BARRIER (MP 75.4)
(IMPACTS FROM BOTH ROCK REMOVAL AND
RETAINING WALL OPTIONS ARE SHOWN HERE)
SURVEY AREA
Calf Creek
DRY WASH 15
PERMANENT IMPACT <0.01AC
TEMPORARY IMPACT <0.01AC
Calf Creek Recreation Area
MP 75
5b. IMPROVE INTERSECTION AT
CALF CREEK RECREATION
AREA (MP 75.0)
SEE SHEET 7 OF 7
3a. STABILIZE ROADSIDE
BARRIER (MP 74.8)
2. REPLACE CALF CREEK
BRIDGE (MP 74.5)
WET MEADOW
WET MEADOW
DRY WASH B
DRY WASH A
Figure 3.12 Jurisdictional Water Features (Detail Sheet 6 of 7)
SR-12 Right-of-Way Requested
Detail Sheet 7
Jurisdictional Water
Survey Area (U.S. Waters)
SR-12 Alignment
Grand Staircase - Escalante National Monument Boundary
Impact Area (Permanent)
Impact Area (Temporary)

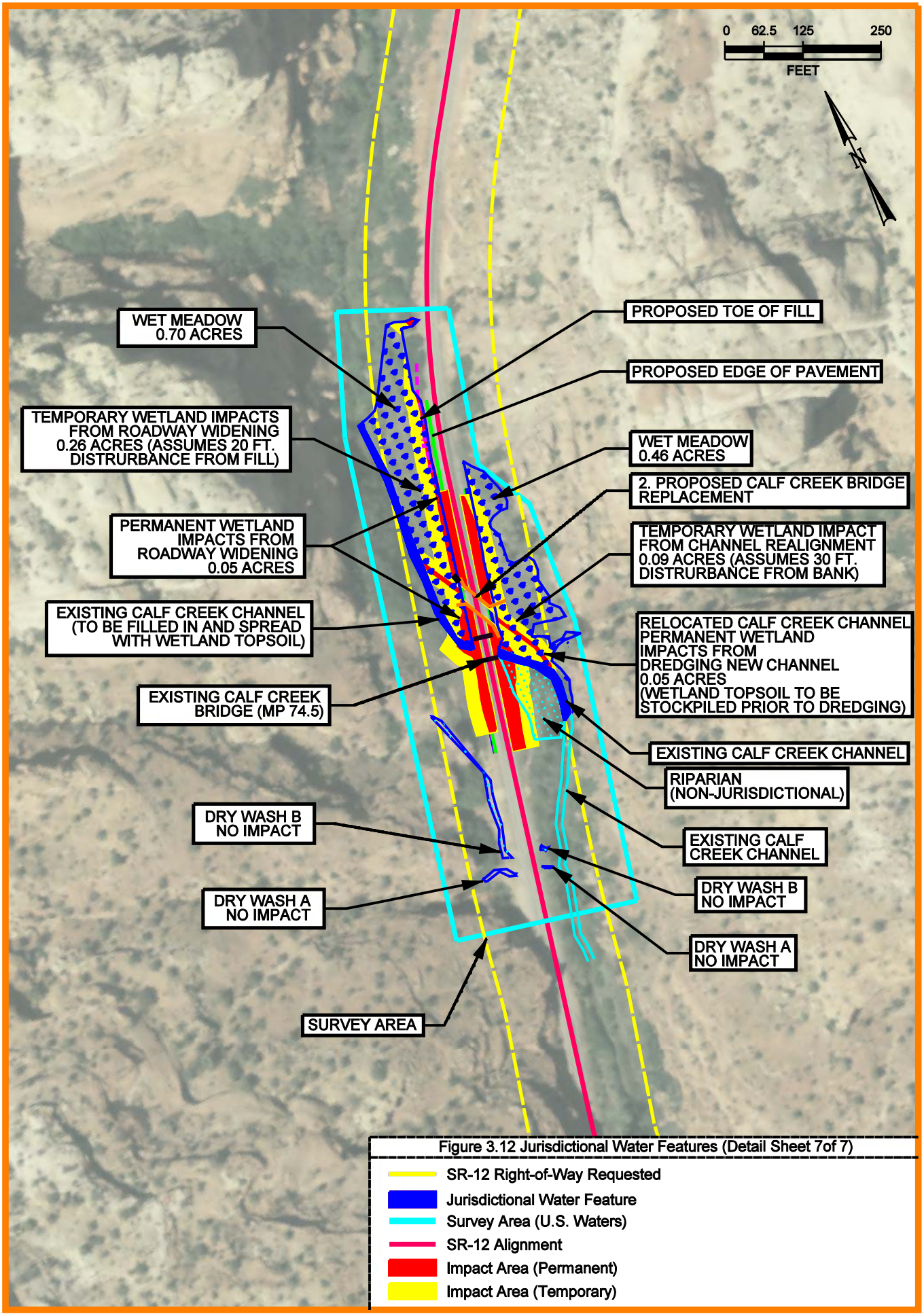
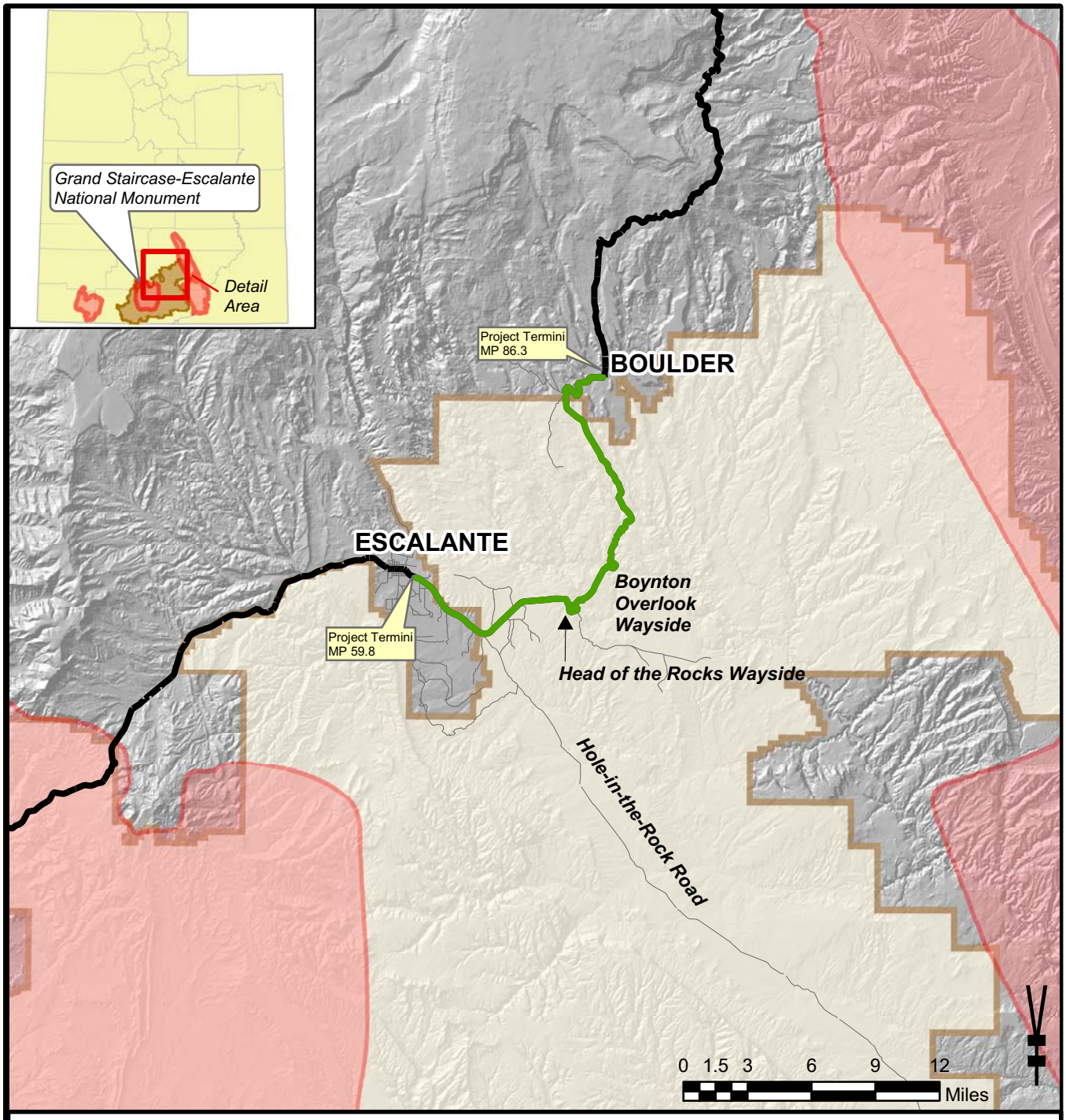


Figure 3.12 Jurisdictional Water Features (Detail Sheet 7of 7)

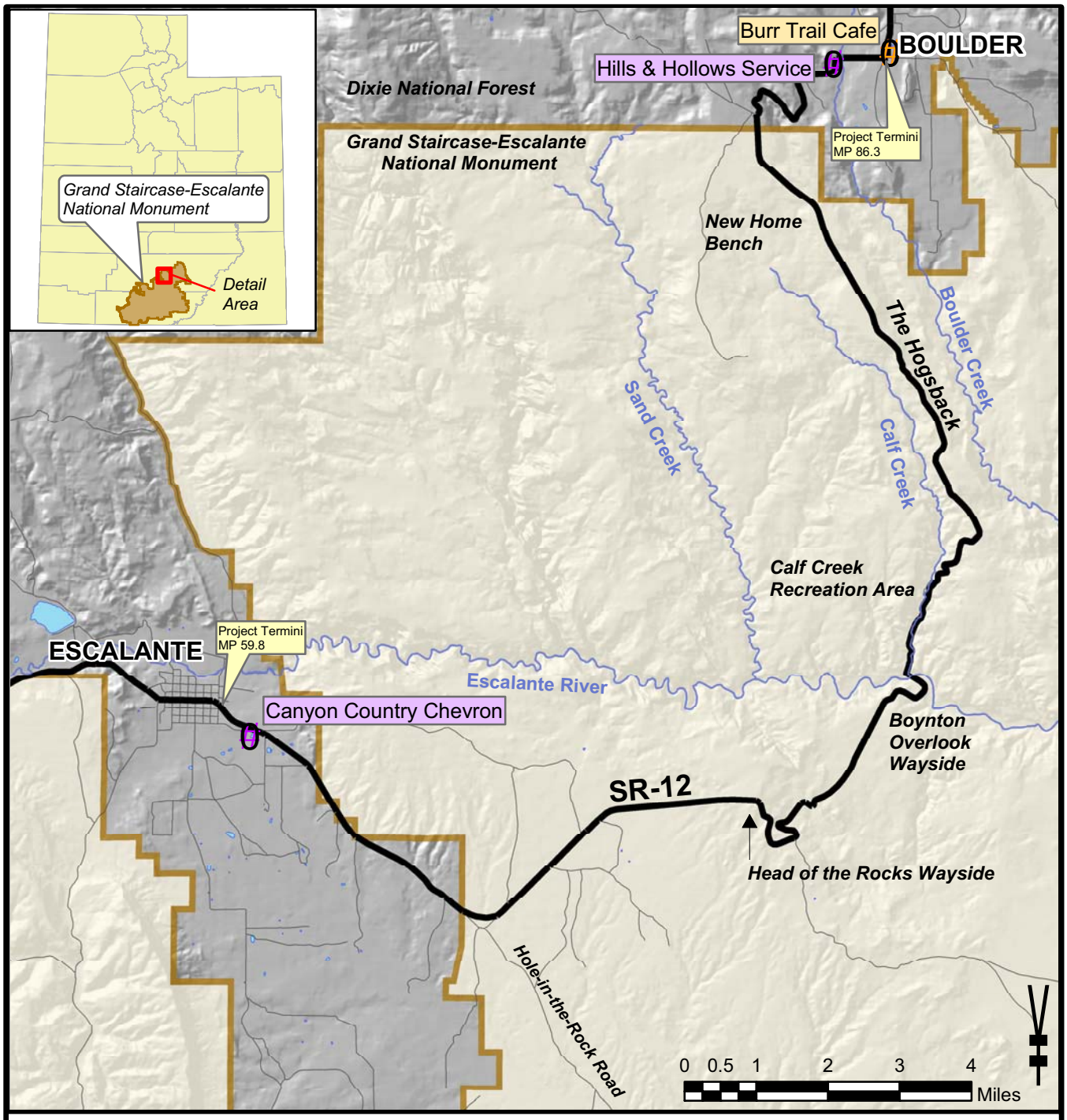


SPOTTED OWL HABITAT

- Project Corridor
- State Route 12
- Local Roads
- Stream
- Spotted Owl Habitat
- Grand Staircase-Escalante National Monument Boundary

*Sources: AGRC (2002), BLM Grand Staircase-Escalante National Monument (2006), and Garfield County (2003)

SR-12 Escalante to Boulder	STP-0012(8)60E	Figure No. 3.13	
		December 2007	



HAZARDOUS WASTE AND PETROLEUM SITES

- Grand Staircase-Escalante National Monument Boundary
- State Route 12
- Local Roads
- Stream
- Underground Storage Tank
- Underground Storage Tank-Previous Leakage

*Sources: AGRC (2002), BLM Grand Staircase-Escalante National Monument (2006), and Garfield County (2003)

SR-12 Escalante to Boulder	STP-0012(8)60E	Figure No. 3.14
		December 2007